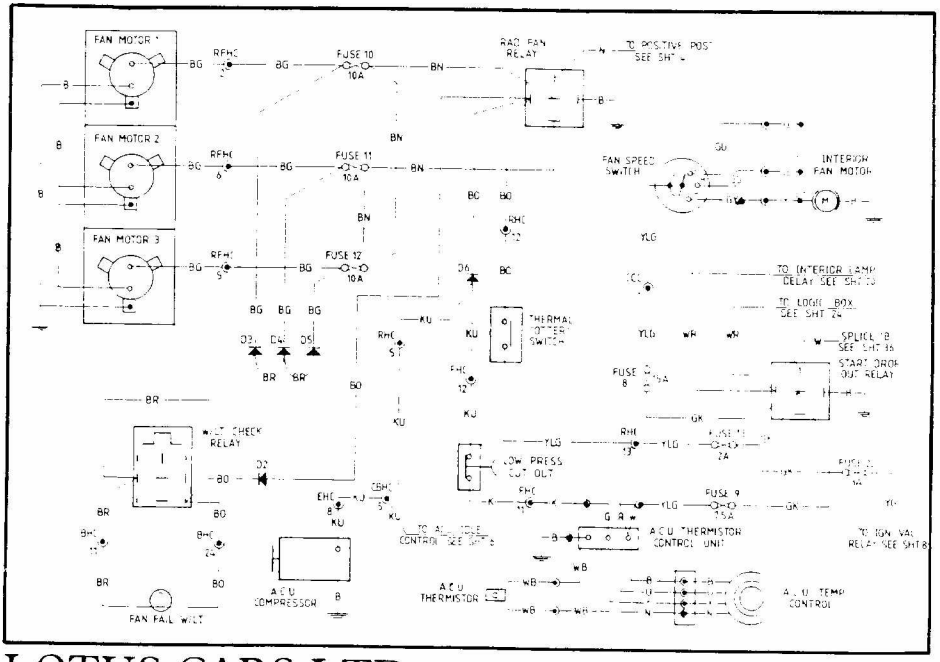
SERVICE NOTES
Electrical Sections



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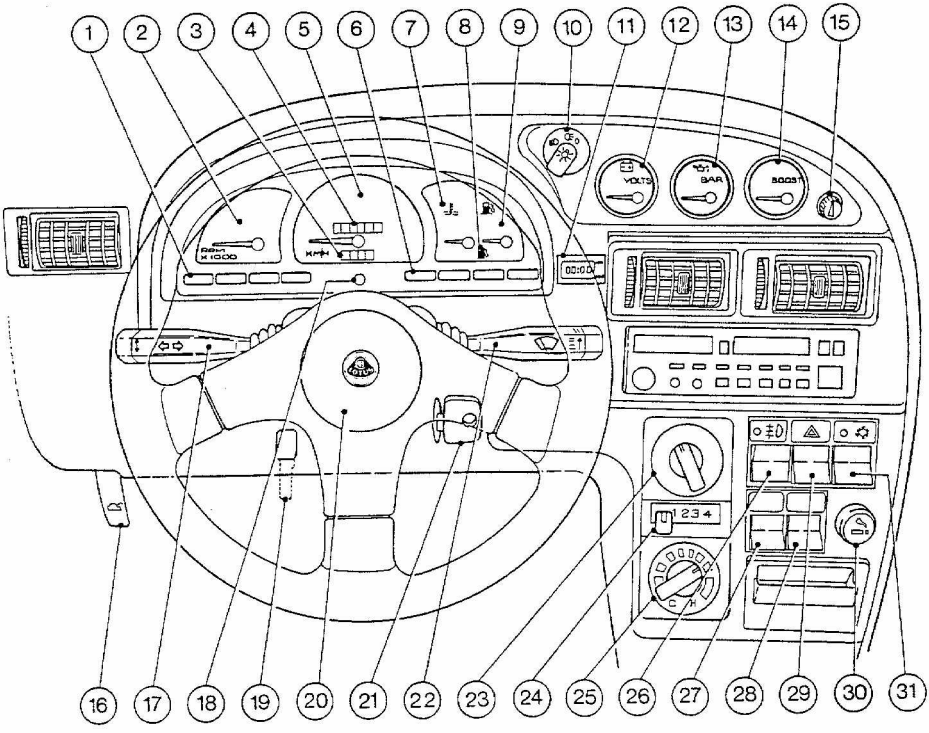
ELECTRICAL SECTIONS

CONTENTS

Model	Section
'90 M.Y. onwards Elan	MJ
'90 to '92 M.Y. Esprit, inc. S.I.R. & ABS	MK

Left Hand Drive



1. Left hand tell tale bank
2. Tachometer
3. Trip distance recorder
4. Total distance recorder
5. Speedometer
6. Right hand tell tale bank
7. Water temperature gauge
8. Low fuel tell tale
9. Fuel gauge
10. Main lighting switch
11. Digital clock (Turbo)
12. Voltmeter
13. Oil pressure gauge
14. Boost gauge (Turbo) or analogue clock (N.A.)
15. Panel illumination rheostat
16. Bonnet release lever
17. Beam/dip & turn indicators
18. Trip reset knob
19. Column height clamp lever (Not USA)
20. Horn button (USA each side near rim)
21. Ignition/starter/steering lock
22. Windscreen wash/wipe control
23. Airflow distribution control
24. Fan speed switch
25. Heater temperature control
26. Rear fog lamps switch (Air con. switch on USA cars)
27. Switch blank
28. Switch blank
29. Hazard warning lights switch
30. Cigar lighter
31. Air conditioning switch (Blank on USA cars)

Ignition/Starter Switch/Steering Lock

Insert the key into the slot, and turn clockwise to position 'I' to unlock the steering column, and to position 'II' to switch on the ignition and operate auxiliary equipment. Do not, however, leave the key in this position for extended periods without the engine running, since although the ignition system itself draws no current when the engine is stopped, the ignition power relay will cause a small battery drain even without auxiliary equipment operating.

Turn further clockwise to 'III' against spring pressure to operate the starter motor. As soon as the engine starts, allow the key to return to position 'II'. To stop the engine, turn the key back to 'I', and to remove the key, turn fully counterclockwise to 'B' and withdraw. The steering column will be locked automatically when the key is withdrawn from the lock.

On non-USA cars, the radio operates with or without the key. On USA cars however, a radio feed relay is fitted which is energised by the 'key in' switch so that the radio operates at position 'I' (and 'II') and after returning to 'B'. A battery drain will thus occur through the radio relay whenever the key is in position, unless inserted without unlocking the column. As a 'key in' reminder on USA cars, a chime will sound for about five seconds if the ignition is switched off, and the key left in position when the driver's door is opened.

Instruments

Speedometer

This instrument displays road speed in both MPH and km/h, or just km/h dependent on market. The instrument incorporates a total distance recorder and a trip recorder, which are calibrated in miles or kilometers dependent on the speedometer primary scale. The trip recorder may be zeroed by pressing the small knob protruding through the instrument glass.

Tachometer

Maximum safe engine speed is 7,700 rpm on naturally aspirated models and 7,200 rpm on Turbo variants. These speeds are those at which the engine management system operates to cut off the fuel supply, and safeguard the engine from overspeeding. Maximum power is developed some 500 rpm lower than these speeds, and it is recommended that gear upshifts are made at the power peak for optimum performance and safety.

Do not run the engine continuously at its maximum speed, or allow overspeeding to occur on the overrun by changing down through the gears too early, as this imposes very high loads on engine components, leading to premature wear and possible failure.

Water Temperature Gauge

Ignition supplied. Under normal running conditions, the gauge needle will stay around the quarter scale mark, with fluctuations occurring as the operating conditions change. During periods of idling, or in heavy traffic, the needle will rise to just over the three quarter mark before the cooling fans cut in. If however the gauge needle rises well into the top quarter of the scale for more than a few minutes, the engine is in danger of overheating, and driving style should be modified accordingly. If the temperature remains at this level, a problem is indicated and the engine should be stopped and the cause diagnosed and rectified.

Fuel Gauge

The fuel gauge is operative with the ignition switched on, and indicates the proportion of fuel remaining in the 46 litre (10.2 imp.gall; 12.3 US gall) tank. A low fuel tell tale glows when the tank level drops to approximately 9 litres (2.0 imp.gall; 2.4 US gall).

Note that the needle will rise and fall from its reading position quite slowly as the ignition is switched on and off.

Voltmeter

The voltmeter is calibrated from 8 to 16 volts, and indicates battery voltage when the ignition is switched on, and the charge being applied to the battery by the alternator when the engine is running. The normal position of the pointer is between 12 and 14 volts. If the gauge reads excessively high or low for more than a short period, a fault in the charging circuit is indicated.

Oil Pressure Gauge

This gauge registers the pressure of the oil supply in the engine lubrication system, and is calibrated in bar units. Readings will be higher when the engine oil is cold, and at high engine speeds, and there is no cause for alarm if very high readings are indicated when the engine is started in cold conditions.

Under normal running conditions when the engine is warm, oil pressure should be greater than 0.35 bar at idle, and be between 1.4 and 7.0 bar during normal driving, dependent on engine speed.

Boost Gauge (Turbo models only)

This gauge is marked in bar units, and indicates turbocharger boost pressure. The amount of 'boost' developed by the engine is dependent on engine speed and throttle opening, but is controlled by both mechanical and electronic means to prevent excessive boost pressure causing internal engine damage.

Maximum boost pressure readings will be seen with wide throttle openings at normal running temperature, and will be up to 0.65 bar (9.7 lb/in^2). The system allows a controlled amount of overboost for short periods only, following rapid accelerator pedal movement. The indicated figures will rise with increasing altitude or where the atmospheric pressure is lower than normal, although the actual pressures applied to the engine remain unaffected.

An electronic safeguard operates to cut out the fuel pump if a boost control system failure occurs, and excessive boost pressure is detected.

Analogue Time Clock (N/A models only)

The quartz analogue clock is adjusted by pressing in and turning the serrated button at its centre.

Digital Time Clock (Turbo models only)

The digital LCD time clock displays at all times, but is back illuminated for greater clarity when the ignition is switched on. The illumination is dimmed to prevent distraction when the lights are switched on.

Two buttons are provided to adjust the time setting, the upper button for hours, and the lower button for minutes. Use the push key provided on the key ring to gently depress each button in turn. If the battery is disconnected for any reason, the time setting will need adjusting after re-connection.

Instrument Illumination

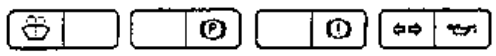
All the instruments, and the analogue time clock (N/A only), are back illuminated when the vehicle sidelights are switched on.

Tell Tale Lamps

Low Screenwash Level Tell Tale (1)

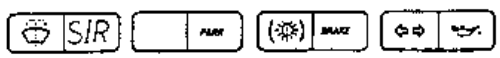
A level sensing switch in the screenwash reservoir will cause this amber tell tale to glow, when the washer is operated and the reservoir level is low.

European type



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

USA type



S.I.R. Tell Tale (2) (USA only)

This tell tale provides a warning if the Supplementary Inflatable Restraint (S.I.R.) self diagnostic system detects a fault. If the tell tale lights at any time other than during the circuit test period detailed below, the fault should be investigated immediately as the S.I.R. system may not function correctly. Refer to separate publication 'Section WB'.

As a bulb and circuit check, the tell tale should flash for about eight seconds when the ignition is switched on, and then go out. When the engine is cranked, the lamp will come on steady, and then flash for another eight seconds after the engine has started.

Parking Brake Tell Tale (4)

A microswitch at the base of the parking brake lever causes this tell tale to glow red, with the ignition switched on, as a reminder that the parking brake is applied. Check that this occurs, and that the light goes out when the brake is released.

Brakes Tell Tale (6)

This lamp is connected to a level sensing switch in the brake fluid reservoir. As a lamp test function, this red tell tale will light together with the parking brake tell tale. If the lamp lights at any other time, or fails to go out when the parking brake is released, a loss of brake fluid is indicated.

Turn Tell Tale (7)

When the left hand or right hand turn indicators are operating, this green tell tale flashes in unison. If the tell tale fails to light, or flashes at an unusual rate, check the operation of the turn indicator lamps immediately.

Oil Pressure Tell Tale (8)

This red tell tale is connected to a combined tell tale/gauge transducer in the right hand side of the cylinder block, and is provided to indicate when oil pressure is below a specified level. Check that the lamp lights when the ignition is switched on. The lamp should go out when the engine is started, although it may flicker at idle in very hot conditions.

If however the lamp lights at any other time when the engine is running, stop the engine immediately, and do not restart until the fault has been investigated and rectified. Note: On Japanese cars, the lighting of this tell tale will be accompanied (as a bulb check function) by the catalyst overheat tell tale.

Battery Non-Charging Tell Tale (9)

This will glow red when the ignition is switched on and will normally go out when the engine is started.

Although the lamp may glow when the engine is idling, if it lights at engine speeds above idle, a fault in the charging circuit, or a broken alternator belt is indicated.

Main Beam Tell Tale (10)

This lamp glows blue whenever the headlamp main beams are operating.

Sidelamps/Parking Lamps Tell Tale (11)

This green tell tale is provided to indicate when the sidelamps or parking lamps have been selected.

Seatbelt Tell Tale (12)

Except USA: this lamp will glow red when the ignition is switched on, and go out when the driver's seat belt is fastened.

USA: when the ignition key is turned to start the engine, this lamp will flash for approximately eight seconds. If the driver's seat belt is not fastened, this light will be accompanied by a warning chime.

Catalytic Converter Overheat Tell Tale (13) (Japan only)

This tell tale will glow red if an engine fault occurs which results in the temperature of the catalytic converter rising to a level liable to cause damage. The engine should be stopped for several minutes to allow the converter to cool before proceeding with caution.

As a bulb check function, this lamp will light in conjunction with the low oil pressure tell tale when the ignition is switched on. Only if the catalyst lamp comes on separately is there an indication of catalyst overheat.

Check Engine Tell Tale (15)

The check engine tell tale is provided to:

i) inform the driver that the engine management self diagnostic system has detected a fault;
ii) assist the technician with fault diagnosis.

As a bulb and system check, the lamp will light with the ignition on, and should go out when the engine is started. If, however, the lamp remains on, or comes on whilst driving, this indicates that the self diagnostic system has detected a problem, information on which is stored in the system memory. If the fault cures itself, or is no longer detected, the lamp will go out in most cases after about 10 seconds, but the trouble code will remain stored in the memory for the next 50 starts to indicate to the technician that an intermittent fault has been detected. If no further fault or recurrence is detected during this period, the lamp will no longer light and the stored information will be erased from the memory.

For further information on this feature, see manuals EMJ/EMK/EML.

Fascia Switches

Lights Switch

This three position rotary/pull switch controls sidelamps, headlamps, panel lamps and interior lamps with or without the ignition key in position:

i) Turned fully counterclockwise to '0', all lights are off.
ii) Turn to ≡D(≡ to switch on the side/parking lamps and instrument/switch illumination.
iii) Turn fully clockwise to ≡D to raise the headlamp pods and switch on the headlamps. Note that the headlamps will not switch on until both pods are fully raised.
iv) In any of the three rotary positions, the knob may be pulled outwards to switch on both of the interior lamps.

The three rotary switch positions are illuminated when the lights are switched on.

On USA cars, a warning chime will sound for about five seconds if the driver's door is opened when the lights are switched on and the ignition is off.

Panel Lights Control

This rotary rheostat controls the brightness of the instrument and switch symbol illumination. Turned fully counterclockwise, the illumination is switched off. Turn clockwise to progressively increase the brightness.

Air Conditioning Switch (if fitted)

This rocker switch controls the air conditioning, which functions only whilst the engine is running. The switch symbol is illuminated with the lights switched on, and the adjacent amber tell tale indicates when the circuit is operating. For further information, see Section PE.

Hazard Lamps Switch

This push switch operates with or without the ignition key, and causes all turn indicator lamps to flash in unison. The switch symbol is illuminated with the lights switched on. The red tell tale in the switch button is backlit with the ignition switched on, and flashes when the circuit is operating.

Rear Fog Lamps Switch (Not USA)

The rear fog lamps, incorporated into the rear lamp clusters, operate only in conjuction with the headlamps, and should be used only in conditions of seriously reduced visibility. The fog lights symbol for this rocker switch is red illuminated with the lights switched on, and an adjacent amber tell tale lights when the circuit is operating.

Cigar Lighter

The cigar lighter, which functions only with the ignition switched on, is operated by pressing in fully. When the element has been sufficiently heated, the lighter will spring outwards ready to be withdrawn for use.

Column Switches & Horn

Headlamp Dipswitch/Flasher/Turn Indicators

The steering column left hand lever switch controls the headlamp dipswitch, headlamp flasher and turn indicators.

Headlamp Dipswitch: The headlamps must be selected via the master lighting switch before the pods will rise with the headlamps lit. The left hand lever switch is then used to select main or dip beam. Main beam is obtained with the lever furthest forward, away from the steering wheel, and dip beam with the lever moved back towards the wheel. The main beam tell tale lamp in the fascia lights when main beam is operating.

Note that the outer pair of headlamps supply the dip beams, and remain lit when the inner pair of main beam headlamps are operating.

Headlamp Flasher: The headlamp flasher is operative at all times. If the lever switch is pulled towards the steering wheel, against spring pressure for a moment, the headlamp pods will rise and the dip beams light for a few seconds before the pods descend. If, however, the lever is held pulled towards the steering wheel, the pods will rise and the main and dip beams operate until about two seconds after the lever is released and the pods descend.

Turn Indicators: The turn indicators operate only with the ignition switched on. Move the lever down to indicate a left hand turn, and up for a right hand turn. The switch will cancel when the steering wheel is returned to the straight ahead position after executing the turn. If the switch is pressed up or down only lightly, the switch will return under spring pressure for convenience when

signalling a lane change.

Windscreen Wipers/Washers

The steering column right hand lever switch controls the windscreen wipers and washer, and is operative only with the ignition switched on.

Windscreen Wipers: The wipers are controlled by the up/down position of the lever switch, which operates as follows:

o moved fully down, the wipers are switched off.

▬▬ move up to the first position for intermittent wipe. The wiper will make one sweep about every five seconds.

▬ move to the next position to select normal wiper operation.

▬ move fully upwards for high speed wipe, for use only in heavy rain. Do NOT at any time use the wipers on a dry screen.

Windscreen Washers: Pulling the lever towards the steering wheel will operate both the washers and the wipers. When the switch is released, the wipers will continue for a further four sweeps.

Horn

The twin tone horns are operative at all times. On cars other than for the USA, the horn button is located in the steering wheel centre boss, whereas USA cars are fitted with buttons at the outer ends of each of the steering wheel spokes.

Windows, Mirrors & Interior Lamps

Door Windows

Raising or lowering of the electrically operated door windows is controlled by two switches on the centre tunnel, one each side of the parking brake lever. The windows operate only with the ignition switched on, when a white dot marker on each switch is illuminated to help locate the controls. Press the front, domed end of the rocker switch to lower the window, and the rear, dished end to raise.

If difficulty is experienced in lowering or raising a window in extremely cold conditions, use a windscreen de-icer spray along the door to glass seal.

Door Mirrors

The rear view mirrors fitted on both driver's and passenger's doors, are electrically adjustable, and incorporate heating elements to aid de-frosting in icy conditions. The mirror control switches are located on the centre tunnel, to the rear of the gearchange lever, and are operative only with the ignition switched on.

Use the rocker switch to select the mirror to be adjusted, and press the dished button to one of its four positions, to adjust the plane of the mirror glass. The small button alongside the rocker switch, energises the heating elements in both mirror glasses, for a period of approximately fifteen minutes before automatically switching off, to avoid unnecessary battery drain. A small amber tell tale light adjacent to the button indicates when the circuit is operating.

Interior Lamps

Two interior lamps are incorporated in the underside of the interior rear view mirror, one to illuminate the driver's compartment, and one for the passenger compartment. To switch on both lamps, pull out the light switch knob on the fascia. To switch on an individual lamp, press the rear of the rocker

switch adjacent to that lamp.

With the lamps switched off, a courtesy function operates as follows: when either door is opened, both lamps will light, and remain lit until about ten seconds after both doors are closed; or immediately the ignition is switched on. This delay allows time for the ignition key to be inserted into its switch.

MJ.2 - FUSES & RELAYS

Main Grouping

The fuses and relays are grouped in four main areas: ahead of the right hand door hinge post; above the instruments; above the driver's footwell; inside the battery compartment (RHD), or behind the LH rear speaker trim panel (LHD).

For access to fusebox 'A' (containing 25 fuses) ahead of the right hand door post, it is necessary to remove the protective trim panel: Use a small coin to release the quarter turn fastener at the front lower edge of the panel, and unhook the panel from the top and rear edges.

An access cover is provided in the top of the instrument cowling, which may be removed after releasing the two fastening screws. Within this area are contained four fuses (fusebox 'B' on RHD), and fusebox 'C' (eight fuses), together with eight standard size relays, and four 'mini' relays.

Two relay blocks, each with provision for six relays, are located beneath the driver's side fascia, and are accessible from within the driver's footwell.

On RHD cars, the battery compartment (below RH side of hood stowage area) contains the fuel pump 'mini' relay and inertia switch, radio fuses and cellular 'phone fuse holders, and the cellular 'phone connector (see later for cellular 'phone details). The inertia switch operates on impact (7g) such as will occur in an accident, to cut off the fuel pump, and unlock the doors via the central locking system. On LHD cars, these components are located behind the left hand rear speaker trim panel, which is removed by releasing the speaker fixings and pulling the panel from the fir tree fixing at its inboard end.

'Littel' Fuses

The 'Littel' type fuses used in all the above locations, are coloured according to their amperage rating, and may be pulled out from their numbered slots using the fuse extractor tool clipped to the main fusebox bracket ahead of the passenger door hingepost. Spare fuses are stored in the vehicle tool box.

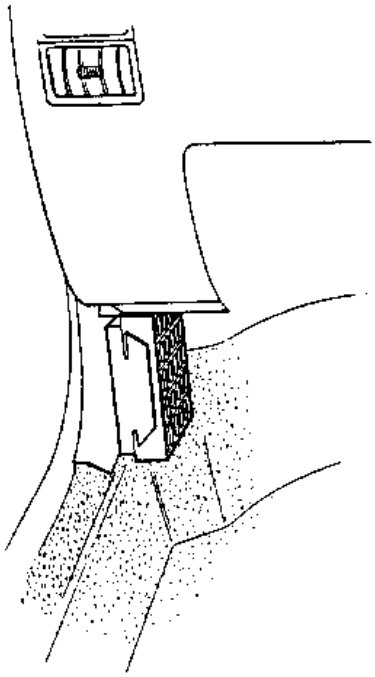
Fuse colours: 2A - black; 3A - violet; 4A - pink; 5A - orange; 7.5A - brown; 10A - red; 15A - light blue; 20A - yellow; 25A - clear.

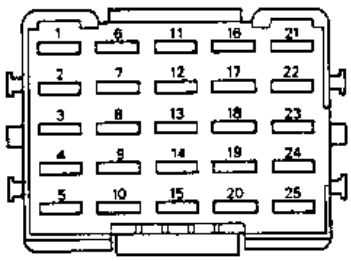
'Maxi' Fuses

Each of the main power feed lines from the positive post is protected by a 'Maxi' fuse, which is provided as an additional safeguard in case of a major short. This fusebox 'D' is located adjacent to the positive post on the tunnel top, behind the centre switch panel, and is protected by a plastic cover secured at each end by a spring clip. For access, the instrument/switch panel must first be removed from the fascia (see section MJ.15).

Main Fusebox (A) - ahead of passenger door hingepost

Right Hand Drive Shown





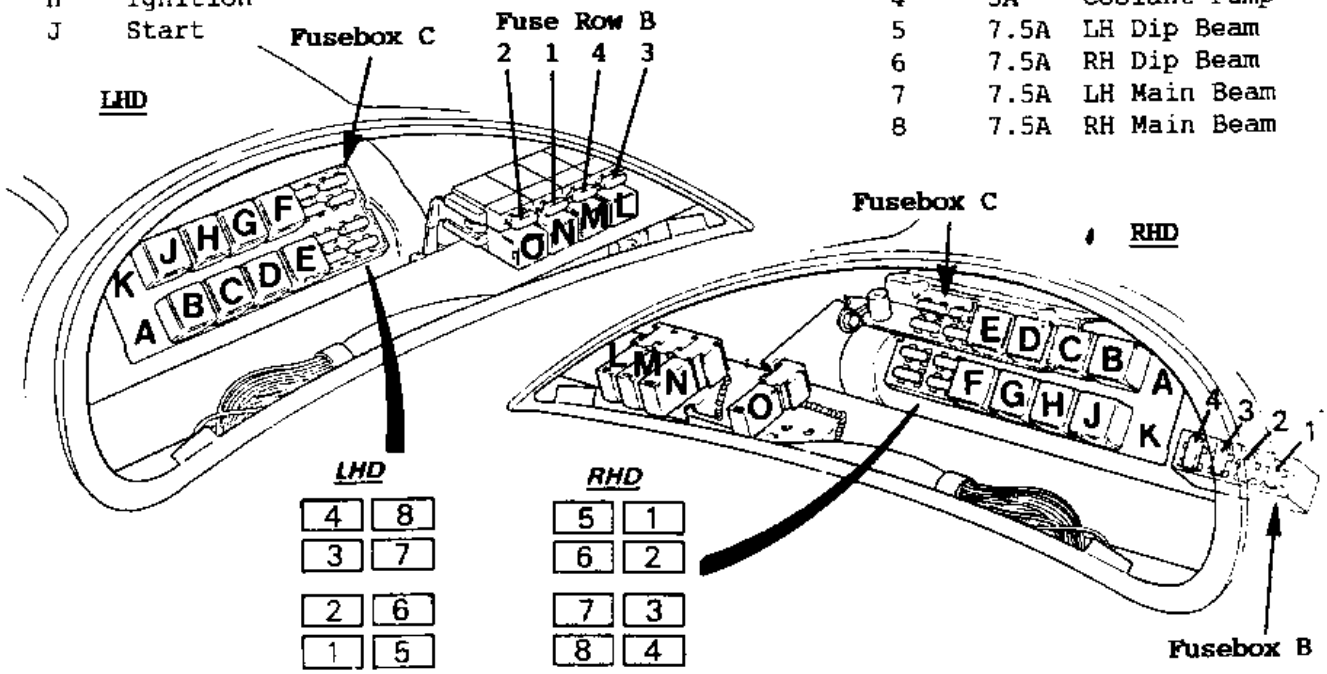
Fuse	Rating	Circuit	Fuse	Rating	Circuit
1	15A	Horns	9	-	
2	7.5A	Air Cond.	10	3A	VSV
3	7.5A	Fuel Pump	11	10A	Hazard
4	10A	RHD Lighting	12	3A	Batt Services
	7.5A	LHD CDL	13	5A	Stoplamps
5	10A	ECM	14	5A	Int. Lamps
6	5A	LH Sidelamps	15	15A	Rear Fog
7	5A	RH Sidelamps	16	10A	DI & Reverse
8	3A	Radio Relay	17	15A	Wash/wipe
		Logic (USA)	18	3A	Ignition 1
			19	3A	Mirror Timer
			20	3A	Ign. Relay
			21	5A	Mirrors
			22	3A	Window Switch
			23	20A	Heater Blower
			24	15A	Cigar Lighter
			25	-	

Relays Above Instrument Cluster

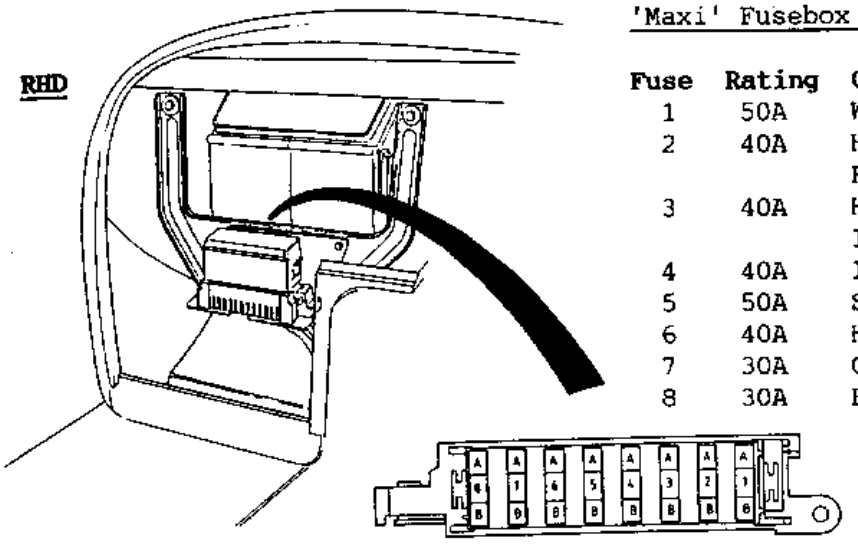
Relay	Circuit	Relay	Circuit
A	-	K	-
B	Air Conditioning	L	Rear Fog Lamps
C	Cooling Fans	M	ECM
D	Blower Fan Fast	N	Blower Fan Slow (a/c cars only)
E	Main Beam	O	Horns
F	Dip Beam		
G	Elec Coolant Pump		
H	Ignition		
J	Start		

Fuses Above Instrument Cluster

Fuse	Rating	Circuit
Fusebox/Row B		
1	20A	RH Window Lift
2	20A	LH Window Lift
3	15A	RH Cooling Fan
4	15A	LH Cooling Fan
Fusebox C		
1	15A	LH H/L Motor
2	15A	RH H/L Motor
3	7.5A	RHD CDL
	10A	LHD Lighting
4	5A	Coolant Pump
5	7.5A	LH Dip Beam
6	7.5A	RH Dip Beam
7	7.5A	LH Main Beam
8	7.5A	RH Main Beam



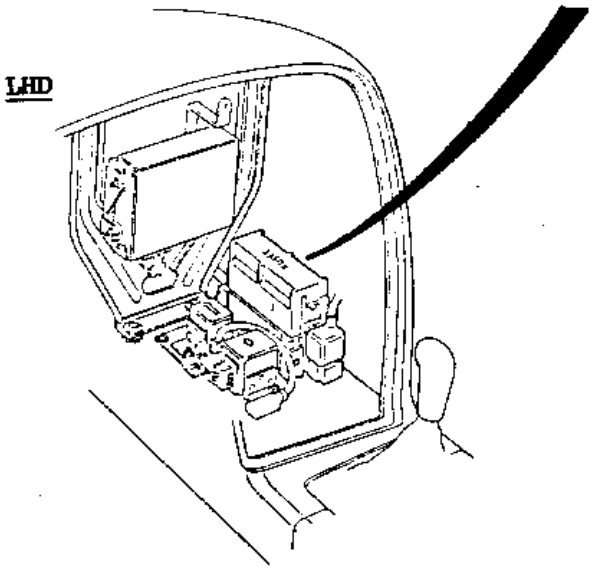
RHD



'Maxi' Fusebox (D) on Tunnel Top

Fuse	Rating	Circuit
1	50A	Window Lift Motors
2	40A	Horn,A/C,Fuel Pump,Lights RHD Lights, LHD CDL
3	40A	Haz,Batt Serv,Stop Lamps, Int Lamps,Rear Fog
4	40A	Ignition Switch
5	50A	Start Relay
6	40A	H/lamps & Mtrs,LHD Lights
7	30A	Cooling Fans Relay
8	30A	ECM

LHD

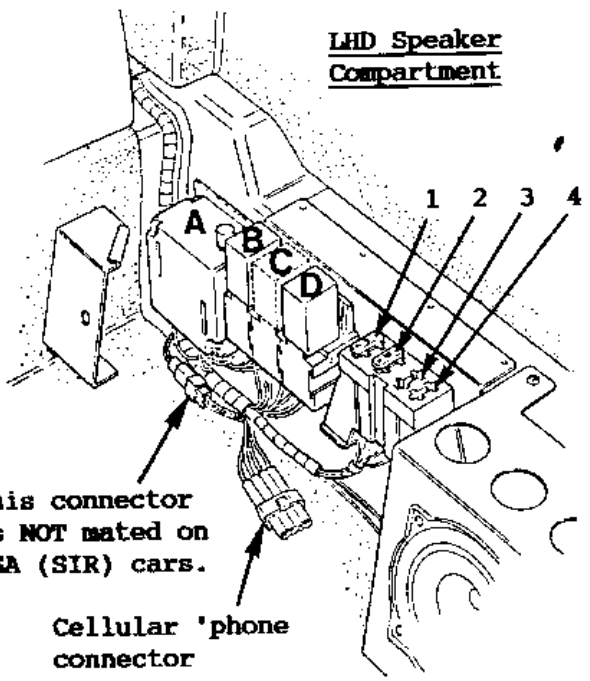


Fuses & Relays in Battery Compartment & Speaker Compartment

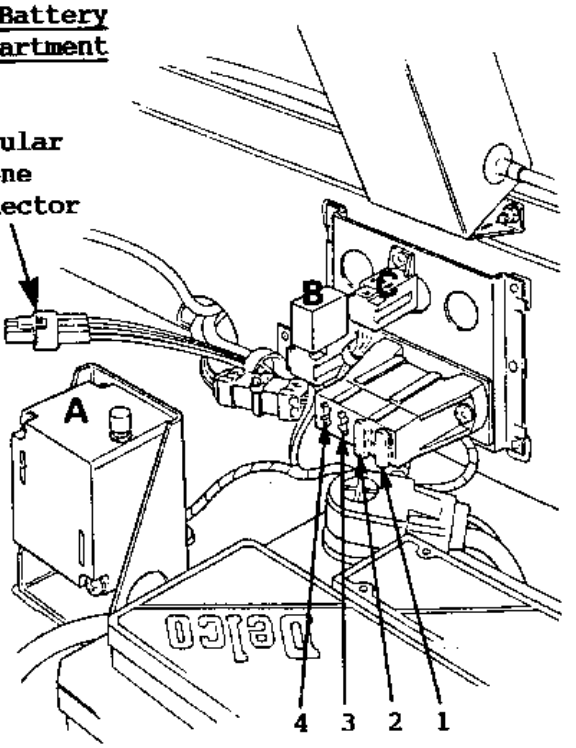
Fuse	Rating	Circuit
1	5A	Radio
2	7.5A	Radio Antenna
3	-	'phone +12V Battery
4	-	'phone +12V Ignition

Relay	Circuit
A	Inertia Switch
B	Fuel Pump
C	Cellular 'Phone
D	Radio Feed (USA only)

LHD Speaker Compartment

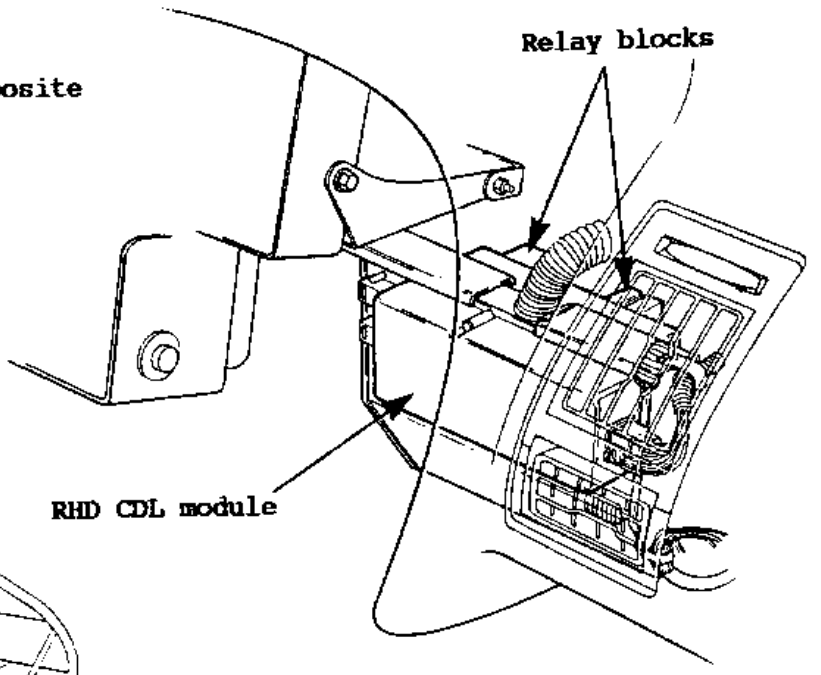


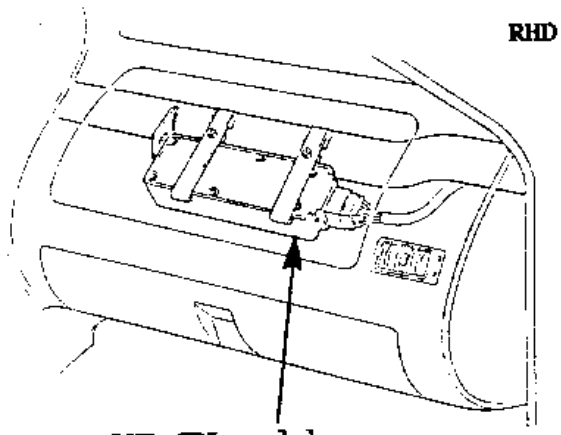
RHD Battery Compartment



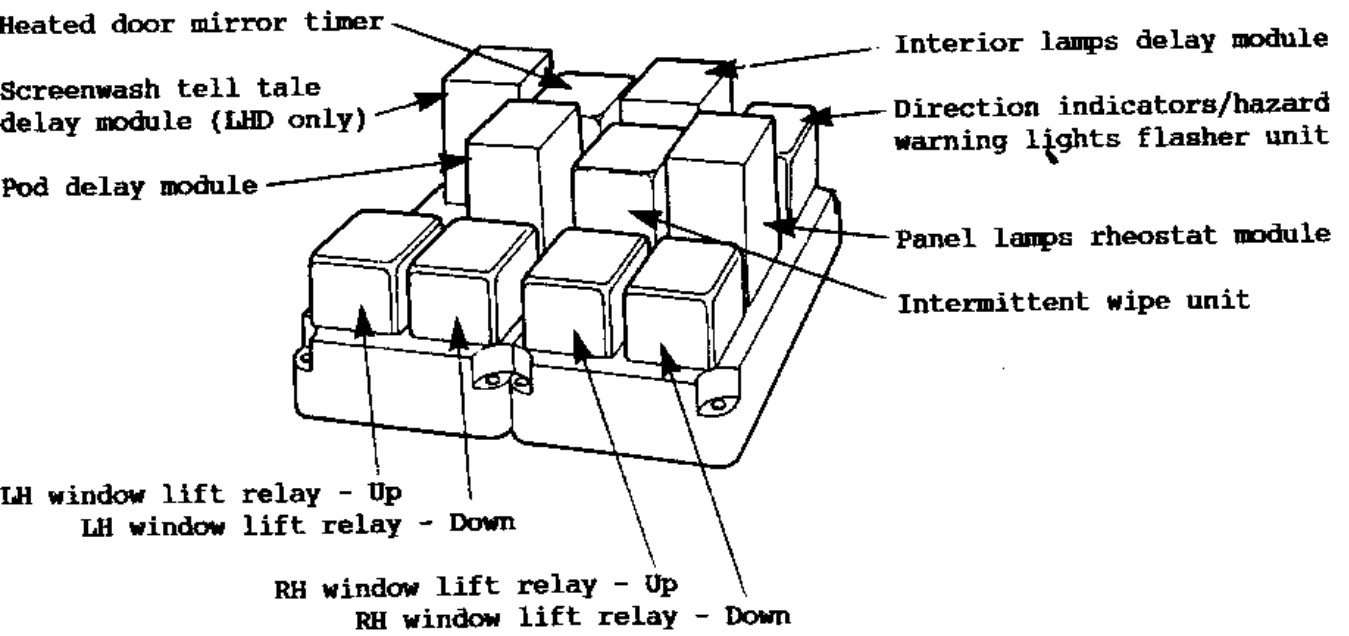
Location of Relay Blocks

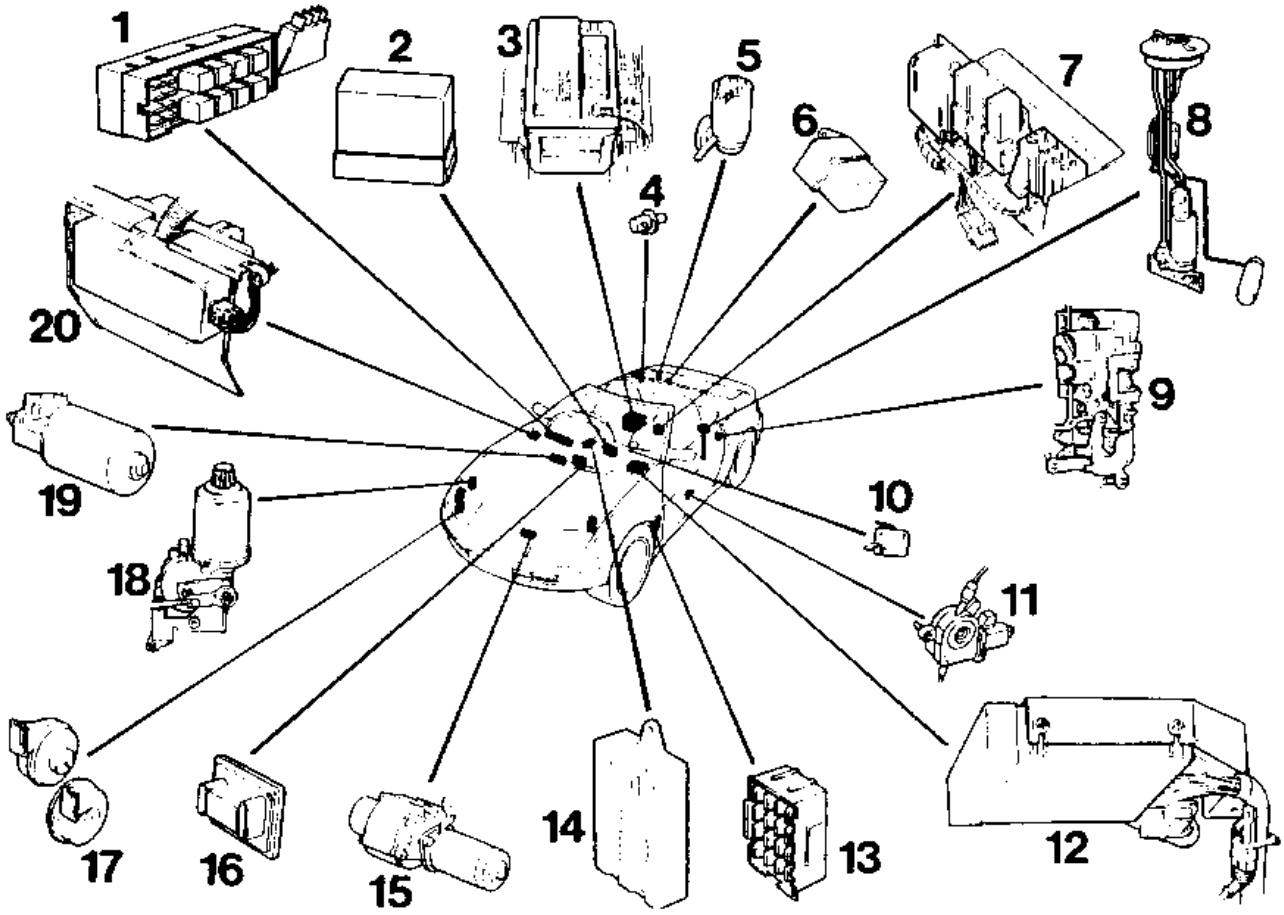
RHD shown, LHD similar & opposite



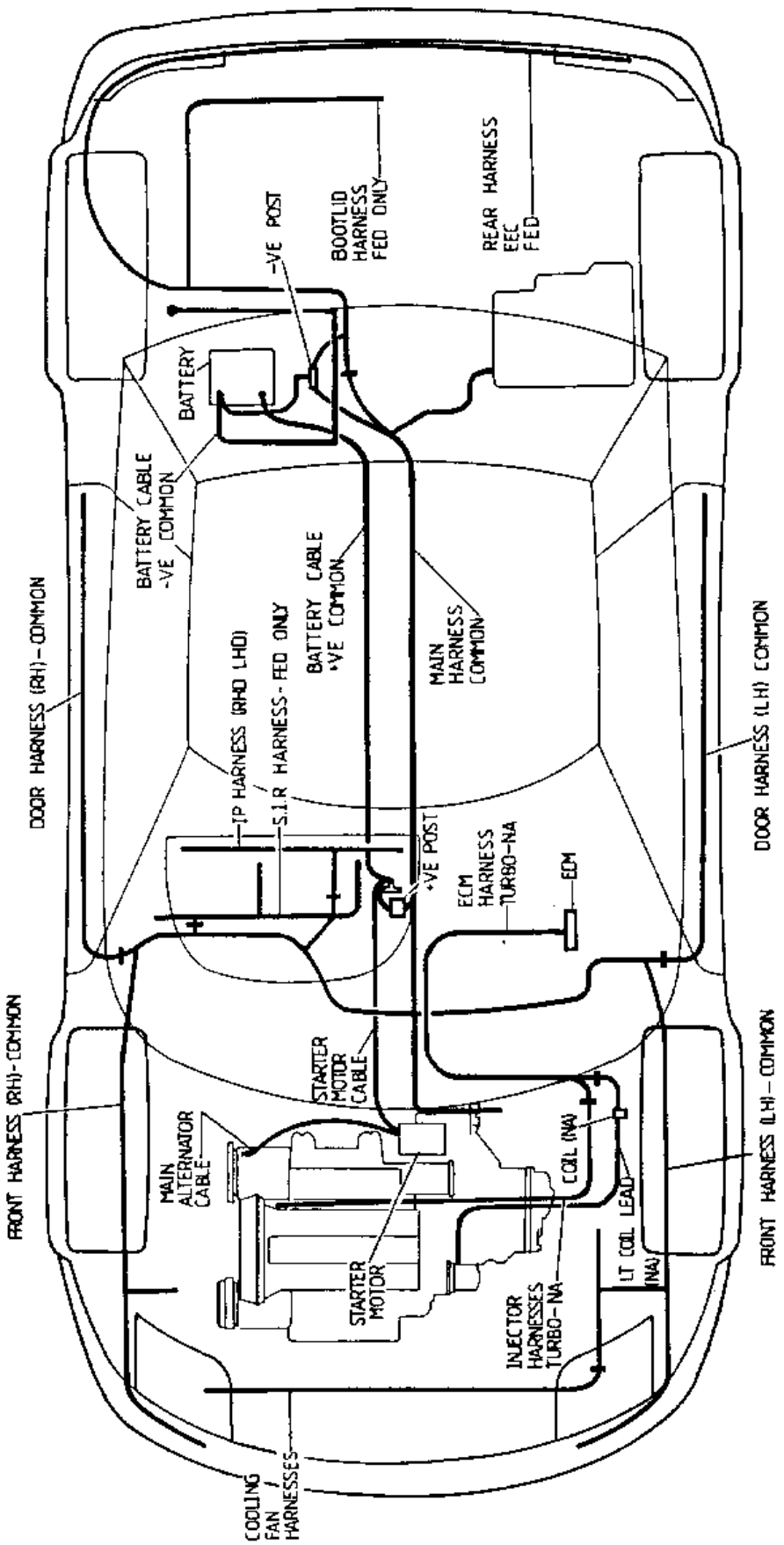


Relay Blocks Viewed From Beneath (RHD & LHD)


Heated door mirror timer
Screenwash tell tale delay module (LHD only)
Pod delay module
Interior lamps delay module
Direction indicators/hazard warning lights flasher unit
Panel lamps rheostat module
Intermittent wipe unit
LH window lift relay - Up
LH window lift relay - Down
RH window lift relay - Up
RH window lift relay - Down

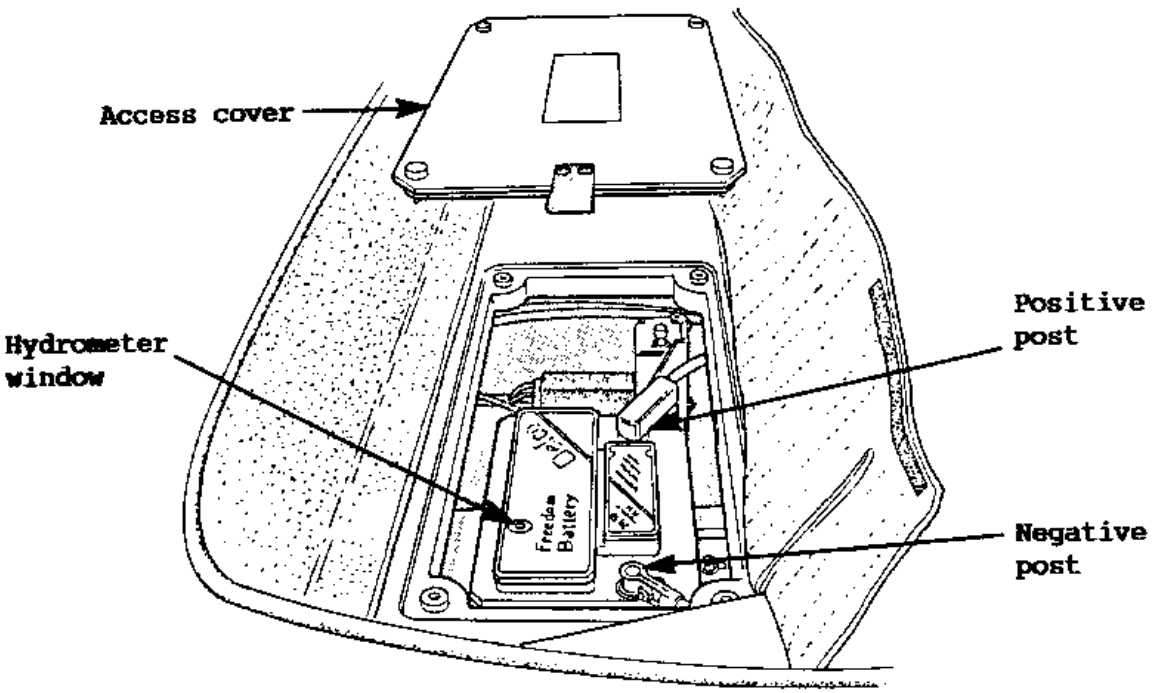


1. Fusebox 'B' and 'C', and relay block above instrument cluster.
2. Maxi fusebox 'D' on tunnel top.
3. Battery, located beneath right hand side of roof stowage compartment.
4. Boot lamp micro-switch on right hand hinge bracket.
5. Windscreen washer pump in bottle at right hand side of boot.
6. Relay for screenwash tell tale by right hand rear lamp cluster (RHD).
7. Accessory panel in battery comp. (RHD), or LH rear speaker box (LHD)
8. Fuel pump/sender unit in tank.
9. CDL actuator assy. in door latch.
10. Parking brake microswitch.
11. Window lift motor.
12. Engine management ECM behind glovebox (RHD), or ahead of LH door post (LHD)
13. Main fusebox 'A' ahead of LH door hinge post.
14. Logic/chime unit on steering column/ pedal box brace (USA cars only).
15. Electric coolant pump at LH front of engine bay.
16. Pod control module on bulkhead at rear of engine bay.
17. Horns in oil cooler radiator duct.
18. Headlamp pod motor, behind each pod.
19. Windscreen wiper motor, at rear of engine bay.
20. Relay station behind driver's side fascia. Also RHD CDL module. LHD CDL module is above glovebox.


-VE POST
BOOTLID HARNESS FED ONLY
REAR HARNESS EEC FED
BATTERY
BATTERY CABLE -VE COMMON
BATTERY CABLE -VE COMMON
MAIN HARNESS COMMON
DOOR HARNESS (RH) - COMMON
IP HARNESS (RHD LHD)
S.I.R HARNESS - FED ONLY
+VE POST
ECM HARNESS TURBO-NA
ECM
DOOR HARNESS (LH) COMMON
FRONT HARNESS (RH) - COMMON
STARTER MOTOR CABLE
MAIN ALTERNATOR CABLE
COIL (NA)
LT COIL LEAD (NA)
FRONT HARNESS (LH) - COMMON
STARTER MOTOR
INJECTOR HARNESSES TURBO-NA
COOLING FAN HARNESSES

WARNING:
POISON/DANGER - CAUSES SEVERE BURNS - KEEP OUT OF REACH OF CHILDREN.
Contains sulphuric acid - avoid contact with skin, eyes or clothing.
Antidote: External - flush with water; Internal - drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately; Eyes - flush with water for 15 minutes and get prompt medical attention.
Batteries produce explosive gases. Keep sparks, flames and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.

CAUTION:
i) Disconnect the **negative** (earth; black;'-') battery cable first, and re-connect last, to minimise the possibility of an accidental short to earth of the battery positive connection.
ii) Before disconnecting the battery, wait for at least ten seconds after switching off the ignition to allow the engine management system to adjust the setting of some components ready for re-starting.
iii) After battery re-connection, a change in the engine performance characteristics may be noted for a period whilst the computer controlled engine management system 're-learns' some of its settings. The duration of this period will depend on driving style, but may be shortened by steady cruising in 4th gear at about 40 mph.
iv) Whenever the battery is re-connected, or a 'jump' start attempted, first ensure that the keys are removed from the vehicle, since under certain circumstances the central door locking may operate and lock both doors.
v) If fitting electrical accessories of any description, note that these also must be of **negative earth** polarity.



The battery is located beneath the hood stowage compartment on the right hand side, and is accessible as follows:

If the hood is raised -

1. Release the two over-centre latches at the windscreen header rail, and pull back the front of the roof to release the hood tensioning mechanism.
2. Raise the rear edge of the roof sufficiently to enable the hood stowage lid to be raised (pull the release handle in the RH door jamb).
3. Remove the access panel from the right hand side of the hood stowage compartment floor.

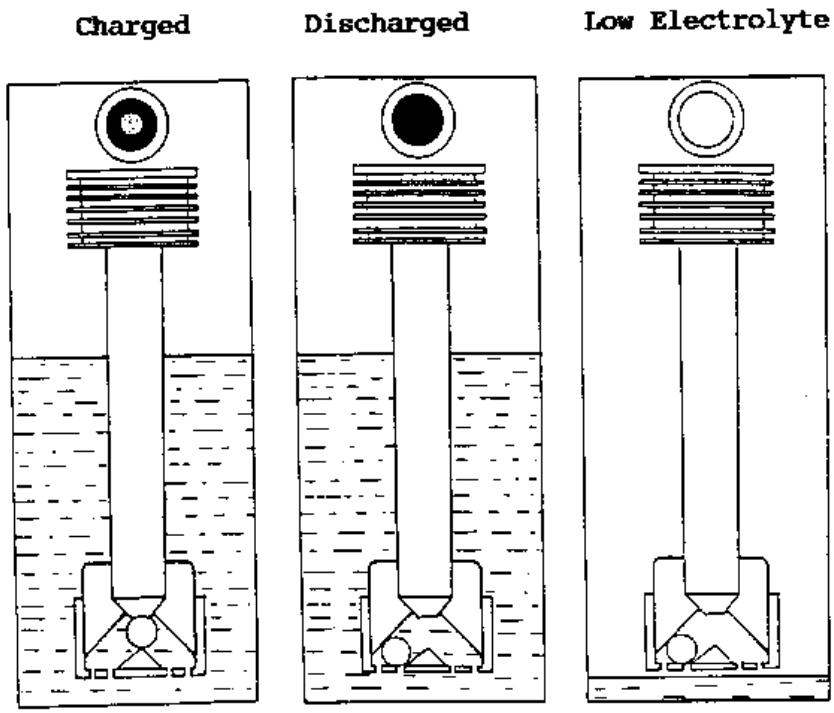
If the hood is down -

1. Open the hood stowage lid (pull the release handle in the RH door jamb), and pull out the folded hood assembly.
2. Remove the access panel from the right hand side of the hood stowage compartment floor.

A Delco Remy 'Freedom' maintenance free battery is fitted, which requires no routine topping up of the electrolyte; with no such provision being made. The battery is equipped with a built in hydrometer which provides a visual indication of the state of charge of the battery.

Built-in Hydrometer

A special temperature compensated hydrometer is built into the cover of the battery to show at a glance the state of charge. The hydrometer consists of a clear plastic rod which extends downwards from a small round window in the battery top cover, into the electrolyte. Fixed to the bottom of the rod is a cage containing a green ball which is designed to float in electrolyte with a specific gravity of 1.220, representing about a 65% state of charge. When the ball floats, it rises to the top of the cage, and appears as a green dot when the hydrometer is viewed vertically. If the ball sinks, the window will appear dark, and if the level of electrolyte falls below the cage, the window will appear clear, or light yellow. These visual indications may be interpreted as follows:
Note: Wipe the window clean and view vertically using a lamp if necessary.



Green dot visible within dark area - battery is over 65% charged which is sufficient for normal use or testing.

Dark with no green dot - battery is less than 65% charged, and should be re-charged before use or testing.

Clear or light yellow - electrolyte level is low due to excessive or prolonged charging, broken case, excessive tipping, or normal wearout. Check that air or gas bubbles are not causing a false reading by lightly tapping the hydrometer. If a cranking problem exists, the battery should be replaced. Do not attempt to test or charge a battery with this indication.

Battery Charging

If the hydrometer indicates that the battery needs recharging, the battery should first be removed to a well ventilated area to avoid a build up of fumes in the battery well. The battery is retained by a clamp plate at the base of the battery front side.

Charge the battery following the charger manufacturers instructions while observing these basic rules:

- If the green dot shows in the hydrometer, there is no need to charge the battery. Charging attempts will only increase the possibility of undesirable overcharge effects.
- Do not attempt to charge the battery if the hydrometer is clear or light yellow and there has been a cranking problem - replace the battery.
- Depending on state of charge, temperature and charger capacity, the battery will accept a charging rate of between 3 and 50 amps. However, at high rates the battery may eject electrolyte through the vents, and/or become hot - over 52°C (125°F). Reduce the charging rate and/or stop for a time to allow the battery to cool.
- Continue charging until the green dot is visible in the hydrometer.

When the battery is fully charged, replace in its compartment and secure with the clamp plate. Re-connect the positive lead first and the negative last.

Battery Testing

Perform the following load test only if a green dot was observed during the hydrometer check. Do not load test if the hydrometer was clear or light yellow. Re-charge the battery if the hydrometer was dark.

Use a voltmeter and battery load tester capable of supplying a load of 200 amps.

i) If the battery has been on charge either externally or via the vehicle alternator, first remove the surface charge by applying a 200 amp load to the battery for 15 seconds. Turn off the load and wait for at least 15 seconds to allow the battery to recover.

ii) Apply a 200 amp load to the battery for a period of 15 seconds, and note the voltage reading at the end of this period just prior to switching off the load.

iii) Estimate the temperature of the area in which the battery was located for the few hours prior to the test, and determine the minimum acceptable voltage for step (ii) from the following table:

Temperature °C	Temperature °F	Minimum Voltage
Above 21	Above 70	9.6
10	50	9.4
-1	30	9.1
-10	15	8.8
-18	0	8.5
Below -18	Below 0	8.0

iv) If the voltage observed in step (ii) is at or above the minimum voltage in the table above, the battery is serviceable. If the observed voltage is less than that in the table, the battery should be replaced.

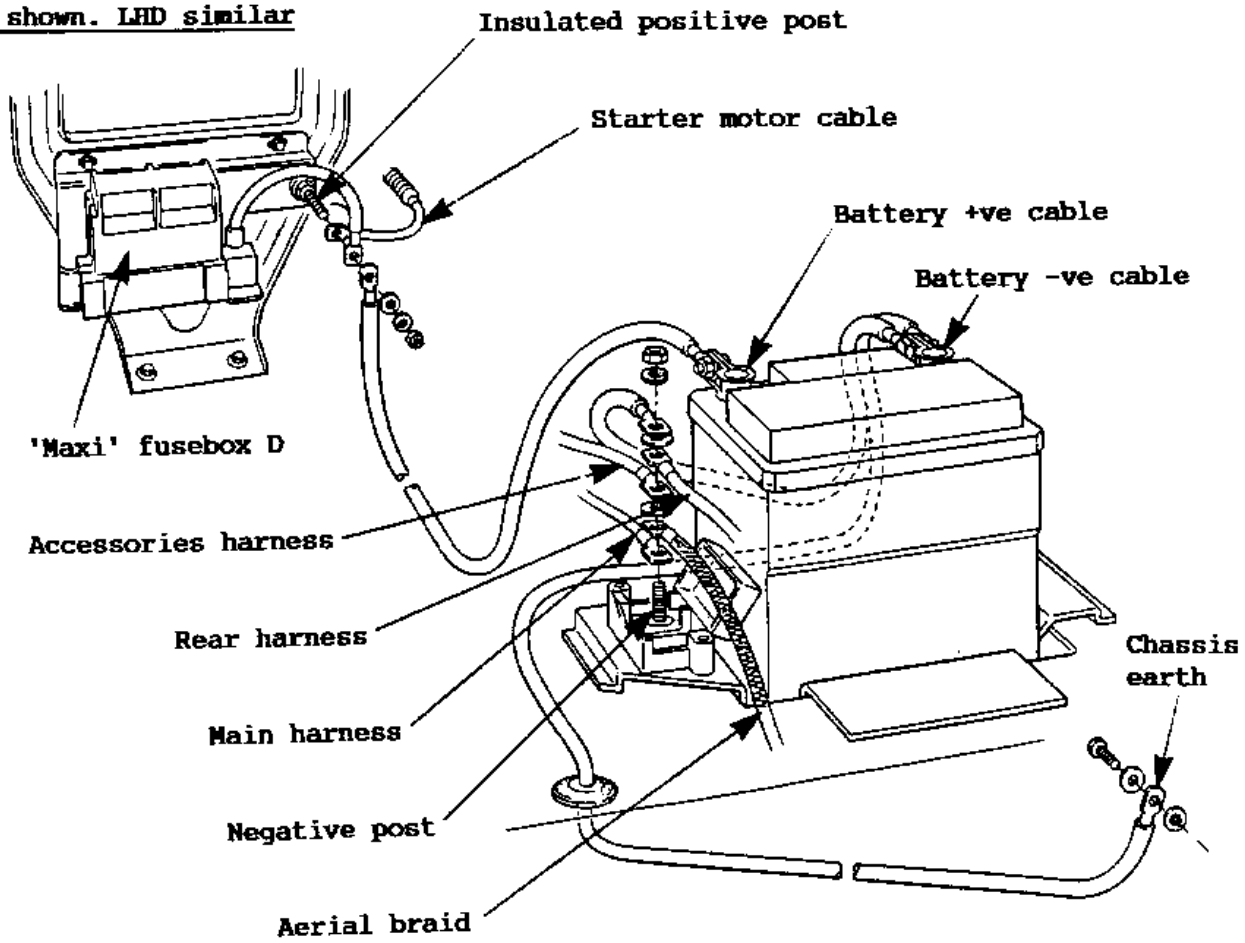
MJ.6 - BATTERY CABLES & EARTH BRAIDS & EARTHING POINTS

Battery Cables

The battery -ve cable runs from the battery to an earth point on the chassis right hand suspension outrigger. A second cable from the battery negative terminal, connects with a -ve post at the left hand side of the battery compartment. This -ve post provides an earth point for the rear harness, fuel pump harness and aerial.

The positive battery cable runs forward along the tunnel top to a +ve post beneath the fascia. This post provides a take off point for the 'Maxi' fuses which supply the major circuit feeds. A separate lead connects this post with the starter motor solenoid.

RHD shown. LHD similar



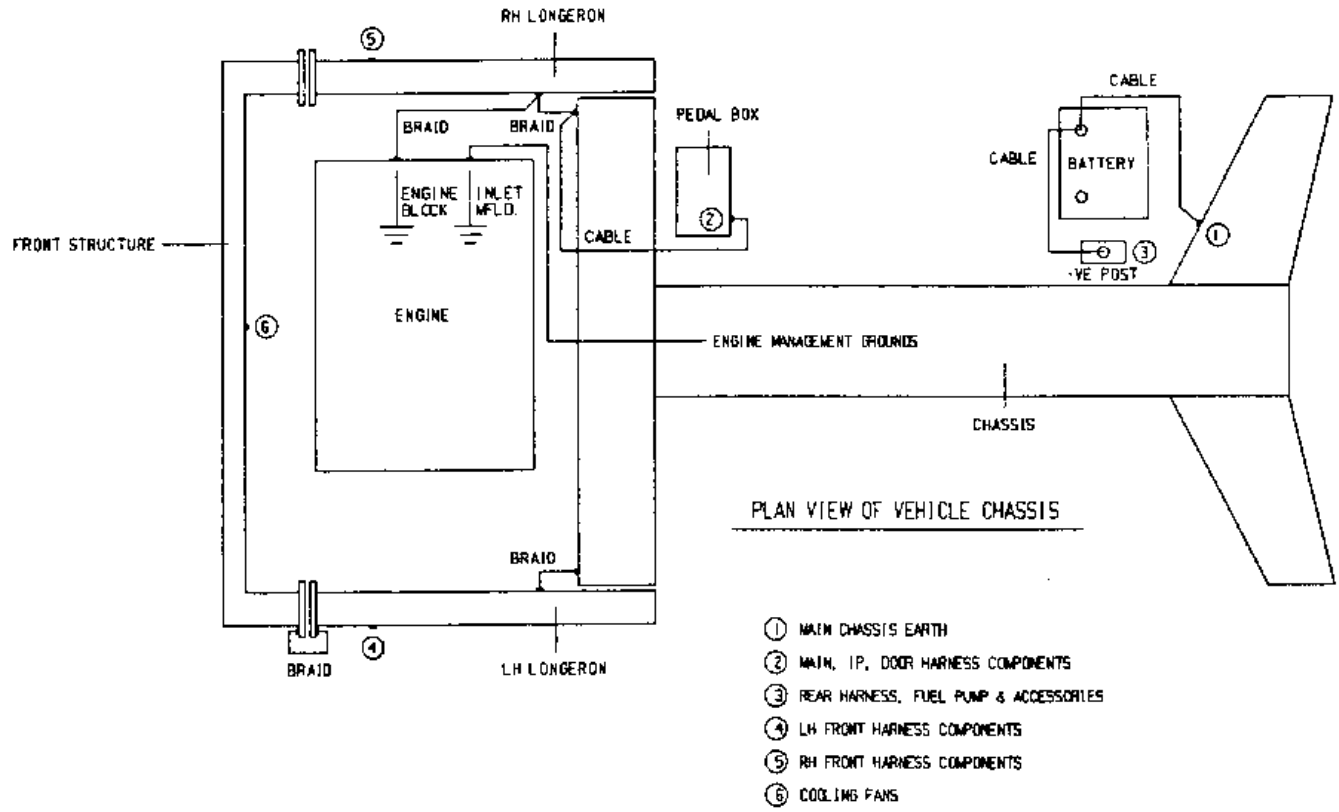
Earth Braids

- An earth cable connects the pedal box to the RH front of the chassis front crossmember.
- An earth braid at each rear corner of the engine bay, connects each chassis front longeron to the chassis front crossmember.
- An earth braid connects the right hand front (rear side) of the cylinder head to the right hand end of the chassis front crossmember.
- An earth braid bridges the joint between the left hand longeron and the chassis front frame.
- An earth braid at each side of the car connects the scuttle beam with the top of the 'A' post. This braid is for suppression purposes only.
- An earth cable connects the driver's side end of the scuttle beam to the pedal box. This braid is for suppression purposes only.

Earthing Points

- At the rear of the car, all earth leads terminate at the -ve post in the battery compartment.
- All fascia and door harness earths terminate at the pedal box.
- The left hand front harness is earthed to the left hand longeron.
- The right hand front harness is earthed to the right hand longeron.
- The cooling fan harness is earthed to the radiator frame.
- All engine management (ECM) earths terminate at an earth point on the engine, at the right hand end of of the inlet manifold.

VEHICLE GROUNDING



Radio Wiring

On cars supplied without a radio fitted, the wiring, which is included in all cars, may be found behind the radio aperture:

+ ve supply (permanent)*	- purple (memory) with 180 series Lucar connector
+ ve supply (permanent)*	- purple (main feed) with 250 series Lucar connector
	* via 5A fuse in battery compartment
earth	- black with 250 series Lucar connector
antenna lead	- co-axial cable
aerial trigger	- purple/orange with 180 series Lucar connector

leads to an aerial connector block at the front of the boot. The connector is also supplied with an electric aerial power feed (purple) via 7.5A fuse in battery compartment, and a (black) earth. The latter two leads are not used with the standard Bosch aerial.

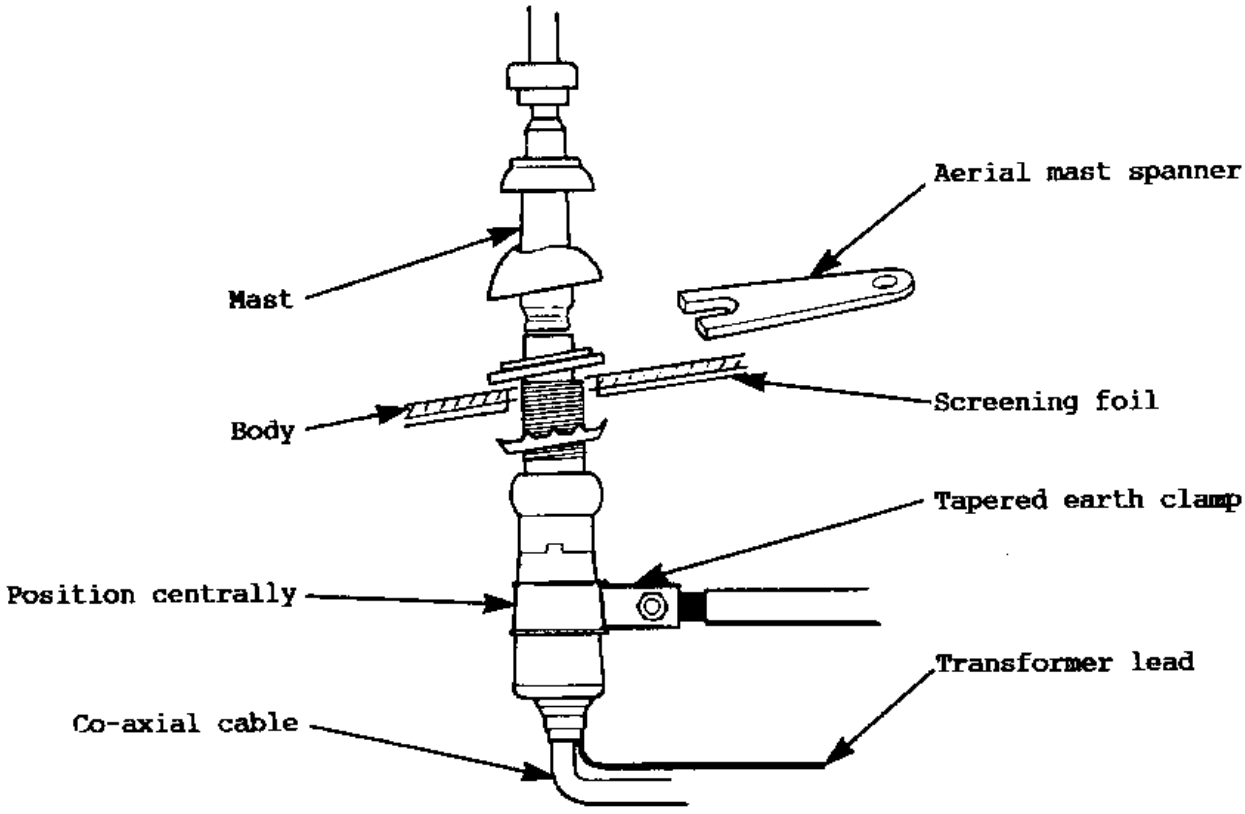
Four speakers are fitted, one in each door, and one behind each seat, each speaker being of 4 ohms impedance, with 25 watts per channel capability. Speaker wiring terminates in four DIN standard speaker plugs, with the harnesses labelled according to their speaker.

Antenna

A Bosch helical whip transformer aerial is mounted on the rear quarter panel on the driver's side, and is maintenance free. A spanner supplied with the vehicle documents, can be used to unscrew the mast from the base unit, to deter vandalism if leaving the car unattended for long periods.

If refitting the complete aerial assembly:

- The aerial must be fitted vertically, with a maximum deviation of 5° leaning backwards.



If refitting the complete aerial assembly:

- The aerial must be fitted vertically, with a maximum deviation of 5° leaning backwards.
- Arrange the clamp that connects the earth strap to the aerial base, so that the tapers on the two components correspond.
- Align the clamp so that the pip on the aerial base fits into the slot formed at the clamp, with the clamp positioned centrally on the aerial base.
- The M8 nut securing the clamp to the aerial should be tightened to 6 Nm nominally, but **must not exceed 10 Nm** or damage may be caused to the electronic components fitted inside the aerial base.

Suppression

Screening foil is fitted in the following locations to suppress radio interference:

- Under the bonnet, between the sound insulation and the bonnet inner panel. The foil is connected, via a braid at each rear corner, to the bonnet hinges, which are themselves earthed via braids to the chassis front crossmember.
- Across the inside of the cabin front bulkhead. The foil is earthed by being sandwiched between the pedal box and bulkhead (pedal box is earthed by cable to the chassis).
- The underside of the rear wing on the side fitted with the radio aerial. This forms a ground plane for the aerial, and is connected via the aerial earth lead to the -ve post in the battery compartment.

A suppression capacitor is fitted to the rear of the alternator, and is connected to the main output terminal.

The steel outriggers which form the sill reinforcments, and 'A' and 'B' posts, are earthed via braids between the 'A' posts and each end of the scuttle beam. The scuttle beam itself is earthed by a braid connecting the driver's end of the beam with the pedal box earth point.
pedal box. This braid is for suppression purposes only.

MJ.8 - CELLULAR TELEPHONE WIRING

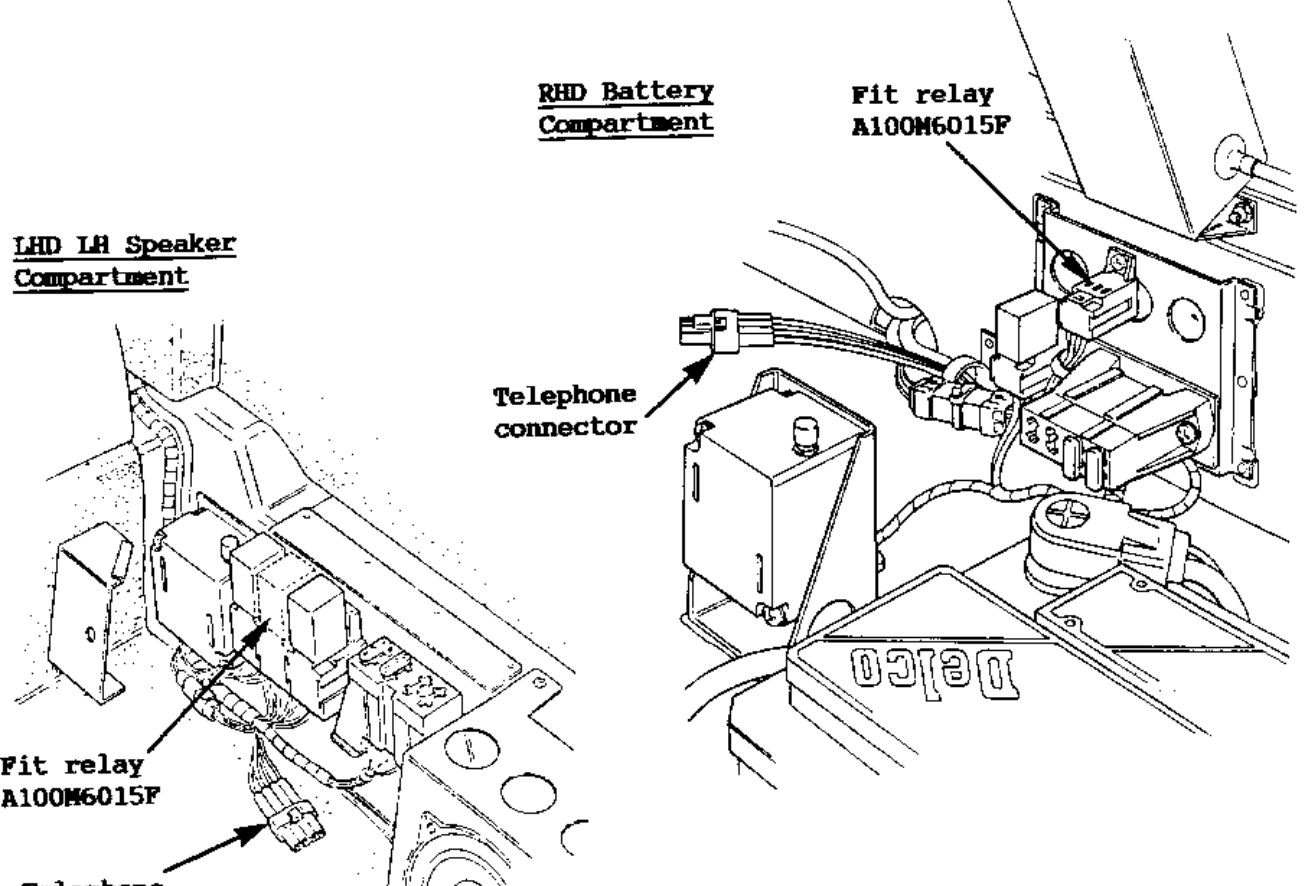
Provision has been made for the connection of a cellular telephone. Within the battery compartment (RHD) or left hand speaker box (LHD), is located a four pin connector containing battery and auxiliary supplies, a panel lights illumination supply, and an earth connection. Fuse holders for the battery and ignition supplies are located alongside the radio fuses on the adjacent fuse/relay panel, and should be fitted with 'Littel' type fuses of a rating recommended by the manufacturer of the system being installed.

In order to provide an interference free line, the ignition supply is controlled by a 'Mini' relay, the relay base for which is located next to the fuel pump relay on the fuse/relay panel. Fit relay part number A100M6015F.

Maximum currents to be drawn from the telephone wiring are as follows:-

-	Panel lights illumination	: 1 amp	(red/brown wire)
-	Earth	: 15 amps	(black wire)
-	Ignition controlled supply	: 10 amps	(green wire)
-	Permanent positive supply	: 10 amps	(purple wire)

A mating connector for the socket provided is available from Rists, part no. 51150006. Terminals 51101169.



MJ.9 - CENTRAL DOOR LOCKING

Central door locking actuators are fitted to both doors so that when one door is locked or unlocked, using either the exterior key barrel, or interior sill button, the opposite door will be operated in a similar manner after a half second delay. The doors should be locked only when both doors are fully closed, as if a door is locked when either door is open, or only closed only on the first latch (ajar), the CDL will operate first to lock both doors, but then after a two second delay, will unlock the doors again. This feature guards against inadvertently locking the keys inside the vehicle.

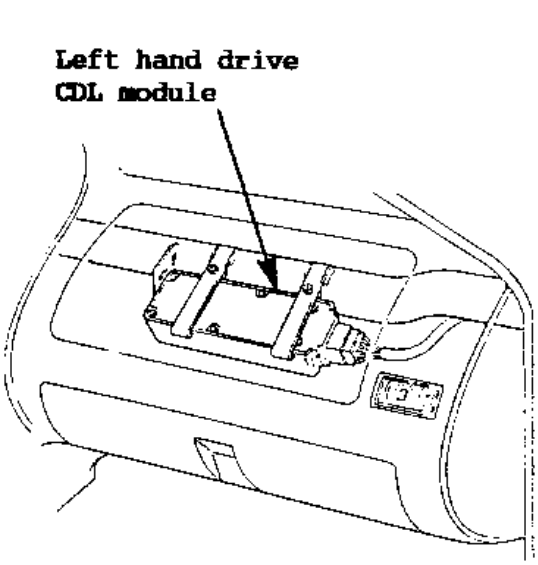
In the event of a flat battery, the CDL will not operate, and each door must be locked or unlocked manually using either the key lock or sill button. In an accident severe enough to trigger the safety inertia switch (7g), in addition to the fuel pump supply being switched off, the CDL system will operate to unlock both doors.

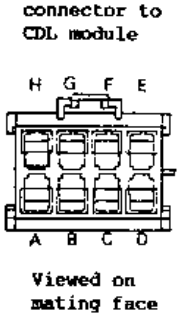
The system comprises the following components:

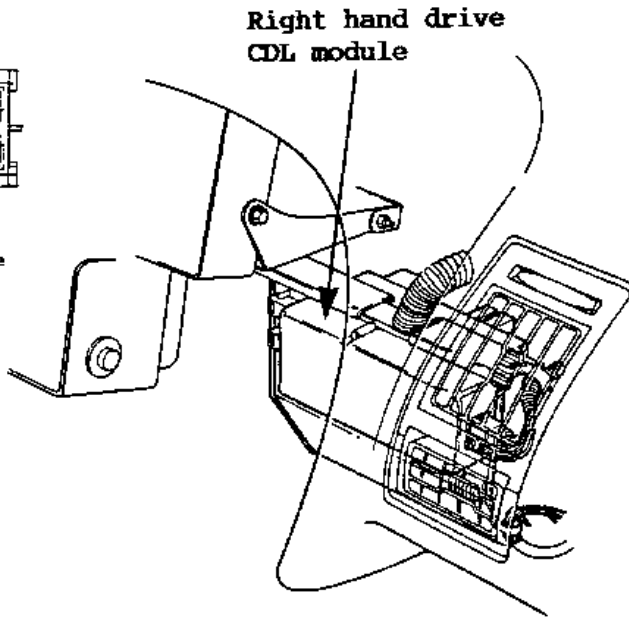
i) Electronic Control Module (ECM); Fitted to the right of the steering column on RHD cars, and to the left of the column on LHD cars. Receives and sends signals to the actuators.

ii) Latch Mechanism/Actuator Motor; One per door, comprising the door latch mechanism and integral actuator motor. Also includes a door ajar switch, and an interior lamps switch. Serviceable only as a complete assembly.

iii) Lock Sensing Switch; Microswitch fitted to each latch mechanism. Supplies a lock status signal to the ECM.

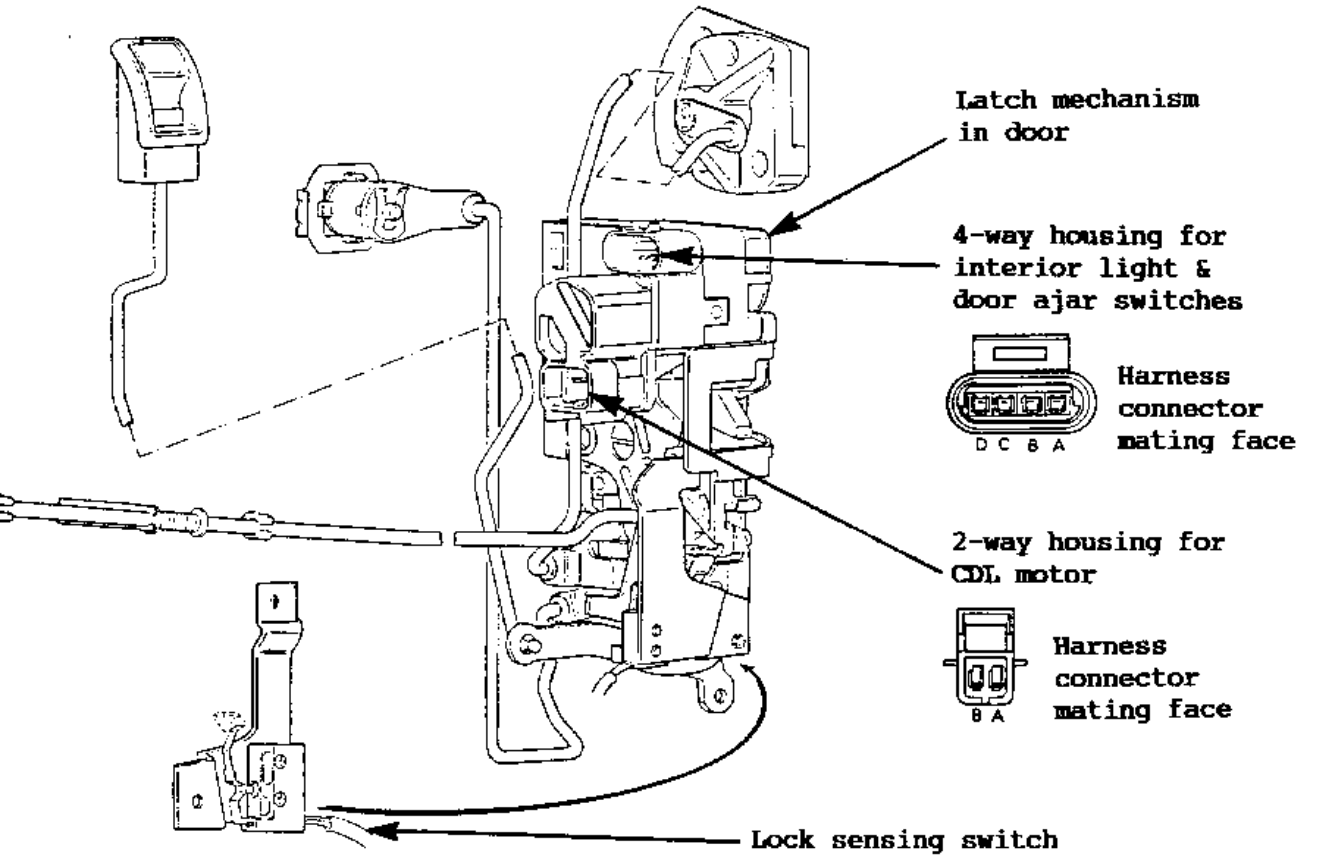






Termination of Electronic Control Module

Terminal	Cable Colour	Function
A	Pink	12 volt supply from fuse no.3
B	Yellow/Black	Actuator motor - 12 volt supply to unlock, ground to lock
C	Yellow/Red	Lock sensing switch, passenger door
D	Yellow/Red	Lock sensing switch, driver's door
E	Yellow/Slate	12 volt supply from inertia switch when tripped
F	Red/Slate	To ground via door ajar switch in each latch mechanism
G	Yellow/Pink	Actuator motor - ground to unlock, 12 volt supply to lock
H	Black	Ground



Termination of Latch Mechanism

	Term.	Cable Colour	Function	Status		
				Door open	1st latch	2nd latch
Left Hand Door	A	Purple/White	Int. lamps	earthed	open	open
	B	Red/Slate	Door ajar	earthed	earthed	open
	C	-	Not used			
	D	Black	Earth			
Right Hand Door	A	Black	Earth			
	B	-	Not used			
	C	Red/Slate	Door ajar	earthed	earthed	open
	D	Purple/White	Int. lamps	earthed	open	open

Termination of Actuator Motors

Terminal	Cable Colour	Function
A	Yellow/Pink	12 volt supply to lock, ground to unlock
B	Yellow/Black	12 volt supply to unlock, ground to lock

Description of Operation

When both doors are in an unlocked condition, both lock sensing switches are closed to earth. If one door is then locked, the lock sensing switch on that door is opened. The ECM processes this signal, and after ½ second delay, operates both actuator motors by supplying 12 volts to terminal A, and a ground to terminal B. Both lock sensing switches are open.

If one door is then unlocked, the lock sensing switch on that door is grounded, and the ECM operates the actuator motors by supplying 12 volts to terminal B, and a ground to terminal A.

If an attempt is made to lock the doors when either door is open, or closed only on the first latch, the system will first operate as above to lock both doors, but then the ECM receives a signal from the door ajar switch that both doors are not fully closed, and after a 2 second delay, unlocks the doors.

For removal of the latch mechanism, or connection of the link rods, see section BJ.

MJ.10 - HEADLAMP MOTOR OPERATION

The headlamp pods are operated by electric motors which are controlled by two electronic modules. These modules can respond to sudden voltage changes, such as may occur when performing other electrical work on the car, and causing the motors operate even with the lights switched off. If carrying out electrical work in the vicinity of the pods, it is recommended to isolate the headlamp motors by unplugging the green and slate two way connectors to the motors.

The components controlling the operation of the headlamps and motors are as follows:

i) Pod Delay Module; Fitted in relay box next to the steering column. Purpose is to delay the dropping of the pods after headlamp flash, to prevent unnecessary oscillation of the pods.

ii) Pod Control Module; Fitted on the front bulkhead in the engine bay (unit has similar appearance to X180 module, but the two units are NOT interchangeable). Purpose is to control the up and down feeds to the headlamp motors, using electronic switches which sense current draw.

iii) Headlamp Lift Motors; One reversing motor operates each headlamp pod via a rotary link and connecting rod.

iv) Full Pod Travel Microswitch; Fitted only on cars with the 'fold back' type headlamp mechanism. One mounted on each headlamp motor mounting bracket, and operated by the rotary link. The contacts of these switches are normally closed to ground, and are opened only when the pods are fully open. Their purpose is to ensure that the headlamps are not switched on until the pods are in their fully raised position so as to avoid dazzle to other road users as the pods operate.

v) Main Beam Relay; Fitted beneath binnacle access panel.

vi) Dip Beam Relay; Fitted beneath binnacle access panel.

Sequence of Operation - Refer to Circuit Diagram Sheet 6

When the headlamps are switched on, the following sequence occurs; a 12 volt supply is applied via the 'U' cable from the lighting switch to delay module pin 6. This switches on the delay module, which then outputs a 12 volt supply from pin 9 via the 'UR' cable to the dip beam relay, and to input pin A of the pod control module. The pod control module then operates the headlamp lift motors as follows:

		'fold back' headlamps	single pivot headlamps
L.H. motor	green cable slate cable	12V from module pin C earth via module pin D	earth via module pin D 12V from module pin C
R.H. motor	green cable slate cable	earth via module pin B 12V from module pin A	12V from module pin A earth via module pin B

Once the pods are fully raised, the control module senses the motor stall, and switches off the 12 volt supply. On early cars with 'fold back' headlamps, when both the pod microswitches are opened (pods fully raised), the delay module provides an earth to the ULG and UG cables via pins 1 and 4 respectively. The dip beam relay is thus energised, and provides a 12 volt supply to both dip beam (outer) lamps, via fuses C5 and C6. If main beam is selected, a 12 volt supply is applied to pin 5 via the UW cable, and to the main beam relay. Because this relay is earthed through pod delay module pin 4 (UG cable), the relay will operate and provide a 12 volt supply to the main beam (inboard) headlamps, via fuses C7 and C8. The dip beam relay remains energised, and the dip beams remain lit in main beam mode.

On later cars with single pivot headlamp mechanisms where dazzle cannot occur during pod operation, delay module pins 1 and 4 are earthed as soon as 12 volts are supplied to terminals 6 or 5. i.e. the headlamps light before the pods are raised.

When the headlamps are switched off, the 12 volt supply to delay module pin 6 is removed, and the delay module switches off. This results in removal of the 12 volt supply to the dip beam relay and the pod control module, and disconnection of the two earth paths on pins 4 and 1. All four headlamps are switched off. The pod control module can now find an earth path through the dip beam bulb filaments via pin C and fuses C5 and C6 (due to the dip beam relay switching off and removing the 12 volt supply from the bulbs). The control module operates to close the headlamp pods:

ii) Pod Control Module; Fitted on the front bulkhead in the engine bay (unit has similar appearance to X180 module, but the two units are NOT interchangeable). Purpose is to control the up and down feeds to the headlamp motors, using electronic switches which sense current draw.

iii) Headlamp Lift Motors; One reversing motor operates each headlamp pod via a rotary link and connecting rod.

iv) Full Pod Travel Microswitch; Fitted only on cars with the 'fold back' type headlamp mechanism. One mounted on each headlamp motor mounting bracket, and operated by the rotary link. The contacts of these switches are normally closed to ground, and are opened only when the pods are fully open. Their purpose is to ensure that the headlamps are not switched on until the pods are in their fully raised position so as to avoid dazzle to other road users as the pods operate.

v) Main Beam Relay; Fitted beneath binnacle access panel.

vi) Dip Beam Relay; Fitted beneath binnacle access panel.

Sequence of Operation - Refer to Circuit Diagram Sheet 6

When the headlamps are switched on, the following sequence occurs; a 12 volt supply is applied via the 'U' cable from the lighting switch to delay module pin 6. This switches on the delay module, which then outputs a 12 volt supply from pin 9 via the 'UR' cable to the dip beam relay, and to input pin A of the pod control module. The pod control module then operates the headlamp lift motors as follows:

		'fold back' headlamps	single pivot headlamps
L.H. motor	green cable slate cable	12V from module pin C earth via module pin D	earth via module pin D 12V from module pin C
R.H. motor	green cable slate cable	earth via module pin B 12V from module pin A	12V from module pin A earth via module pin B

Once the pods are fully raised, the control module senses the motor stall, and switches off the 12 volt supply. On early cars with 'fold back' headlamps, when both the pod microswitches are opened (pods fully raised), the delay module provides an earth to the ULG and UG cables via pins 1 and 4 respectively. The dip beam relay is thus energised, and provides a 12 volt supply to both dip beam (outer) lamps, via fuses C5 and C6. If main beam is selected, a 12 volt supply is applied to pin 5 via the UW cable, and to the main beam relay. Because this relay is earthed through pod delay module pin 4 (UG cable), the relay will operate and provide a 12 volt supply to the main beam (inboard) headlamps, via fuses C7 and C8. The dip beam relay remains energised, and the dip beams remain lit in main beam mode.

On later cars with single pivot headlamp mechanisms where dazzle cannot occur during pod operation, delay module pins 1 and 4 are earthed as soon as 12 volts are supplied to terminals 6 or 5. i.e. the headlamps light before the pods are raised.

When the headlamps are switched off, the 12 volt supply to delay module pin 6 is removed, and the delay module switches off. This results in removal of the 12 volt supply to the dip beam relay and the pod control module, and disconnection of the two earth paths on pins 4 and 1. All four headlamps are switched off. The pod control module can now find an earth path through the dip beam bulb filaments via pin C and fuses C5 and C6 (due to the dip beam relay switching off and removing the 12 volt supply from the bulbs). The control module operates to close the headlamp pods:

MJ.12 - WIPER/WASHER SWITCH & INTERMITTENT WIPE/WASH MODULE (Circuit Diagram 8)

The windscreen wiper/washer operation is controlled by the steering column RH lever switch, which functions electrically as follows:

OFF	OU - ON	cables connected	(terminals 53 - 53e)
SLOW	O - OU	cables connected	(terminals 53a - 53)
FAST	O - OG	cables connected	(terminals 53a - 53b)
INTERMITTENT	O - OP	cables connected	(terminals 53a - J)

The intermittent wash/wipe module is located in the relay blocks adjacent to the steering column, and is provided with 6 cables as follows:

Orange/Purple	Pin 1	12 volt supply to module from wiper switch when intermittent wipe is selected.
Orange/Brown	Pin 2	12 volt output from module to wiper motor via wiper switch.
Black	Pin 4	Ground.
Orange/Black	Pin 5	12 volt input to module from wiper motor limit switch.
Yellow/Lt.Green	Pin 6	12 volt input to module from washer switch.
Orange	Pin 8	12 volt supply to module from fuse A17.

MJ.13 - PANEL LAMPS DIMMER SWITCH & MODULE (see Circuit Diagram Sheet 22)

The brightness of the panel lamp illumination is controlled by a fascia mounted rheostat switch, and a dimmer module located in the relay blocks adjacent to the steering column.

The 6 cables connected to the dimmer module function as follows:

Pink/Black	Pin 4	To panel lamps rheostat.
Black	Pin 5	Ground.
Red/White	Pin 6	12 volt supply from sidelamps switch.
Pink/Brown	Pin 7	To panel lamps rheostat.
Red/Pink	Pin 8	Output from module to panel lamps; 2.2 V - rheostat fully counterclockwise 6.5 V - rheostat at mid position 11.6 V - rheostat fully clockwise
Pink/Lt.Green	Pin 9	To panel lamps rheostat.

The voltages on the three cables connected to the rheostat switch, should be as follows:

Rheostat turned fully counterclockwise (i.e. panel lamps off);
Pink/Brown 6.6 V; Pink/Black 10.25 V; Pink/Green 10.25 V

Rheostat at mid-position;
Pink/Brown 6.5 V; Pink/Black 8.45 V; Pink/Green 10.6 V

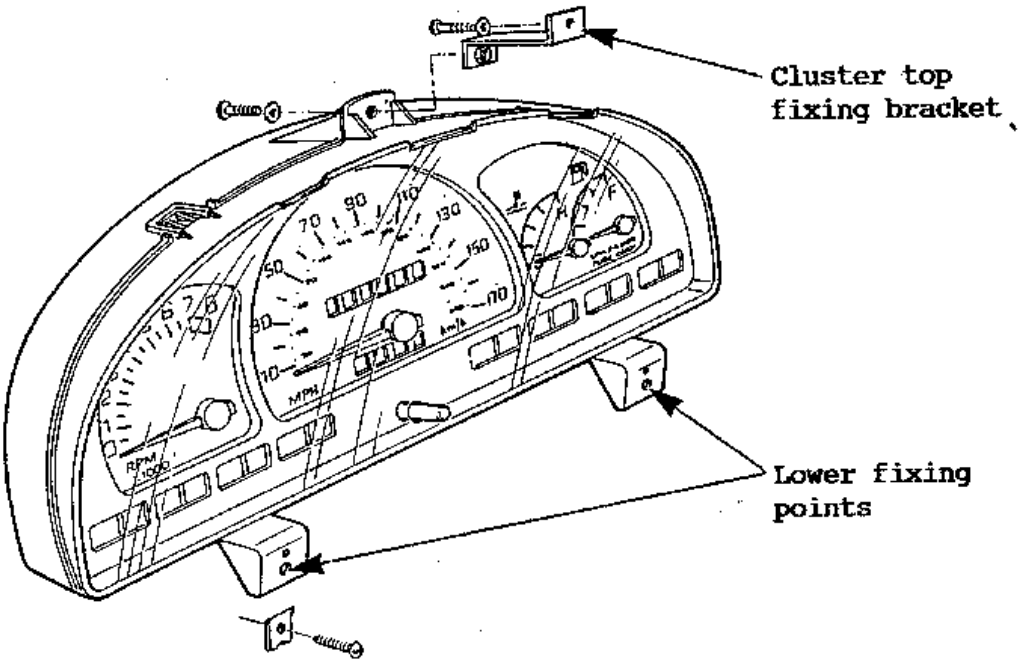
Rheostat turned fully clockwise (i.e. maximum brightness);
Pink/Brown 6.42 V; Pink/Black 6.43 V; Pink/Green 10.04 V

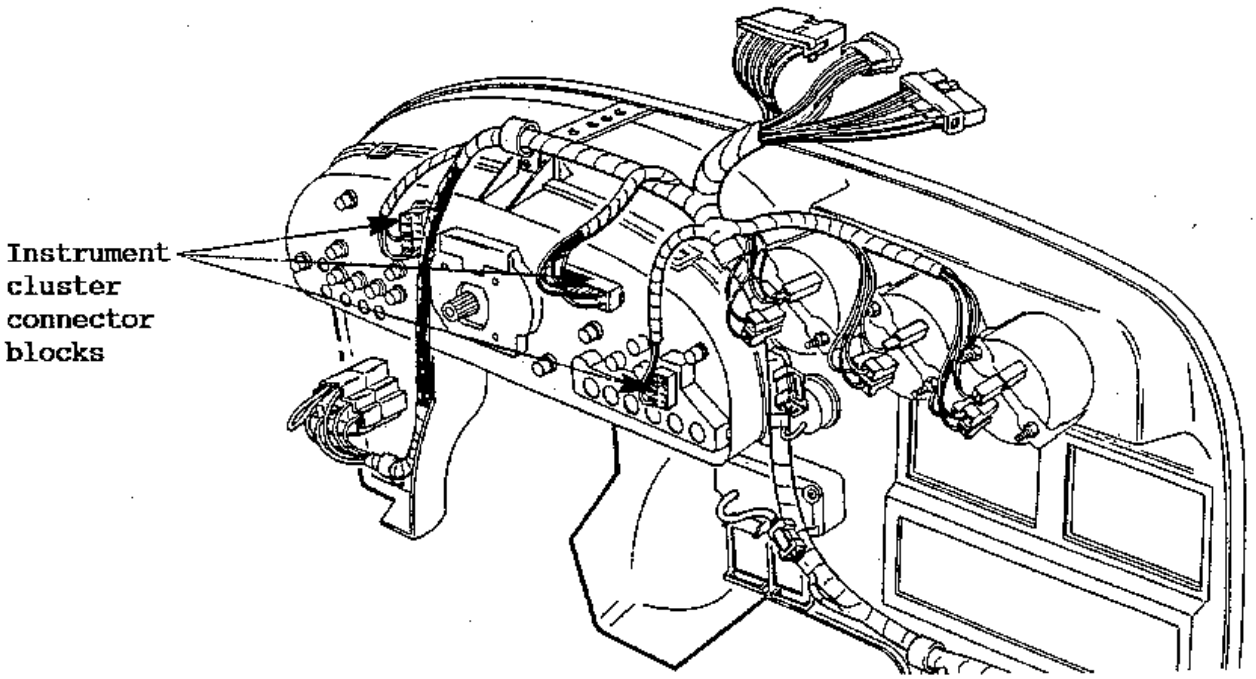
MJ.14 - INSTRUMENT CLUSTER

All the instruments in the main cluster, with the exception of the speedometer, are electrically operated. The main instrument cluster may be removed as a complete assembly via the access panel in the top of the fascia.

To Remove

- Remove the access panel in the fascia top above the instrument cluster.
- Pull out the two grommets from either side of the steering column concealing the two cluster lower fixings. Remove both screws.





- Unclip the speedo cable, and unplug the three harness connector blocks.
- Remove the single screw securing the top of the cluster to the mounting bracket, and the single screw fixing the bracket to the fascia.
- Withdraw the cluster assembly through the access hatch.

To Dismantle the Cluster

1. Pull the trip reset knob out from its snap in fixing.

2. Release the single screw securing the top of the front mask assembly, unhook the lower edge, and withdraw the mask. If necessary, pull off the two tell tale filters from their locating pins.

3. Speed Sensor: This optical pulse generator, is mounted on the top of the back of the speedo. Prise off the clip securing the printed circuit to the sensor, release the single sensor retaining screw, and withdraw the speed sensor.

4. Speedo: Release the four fixing screws, and withdraw the speedo. Do not misplace the speedo cable retaining clip.

5. Tacho: Remove the three fixing nuts and withdraw.

6. Water & Fuel Gauge (combined unit): Remove the four fixing nuts and withdraw the gauge unit. Withdraw the low fuel circuit board.

7. Voltage Regulator: Release the single screw, and unplug the three pins from the printed circuit. Withdraw the heat sink.

8. LH Tell Tale Unit: Release the two screws and withdraw.

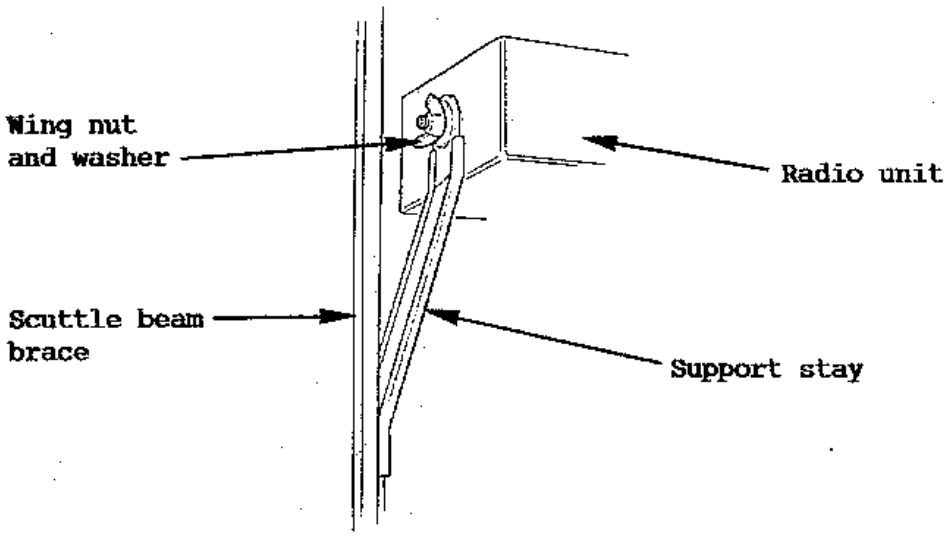
9. Printed Circuit: Release all the bulb holders, and carefully unclip the two printed circuits.

To Re-Assemble the Cluster

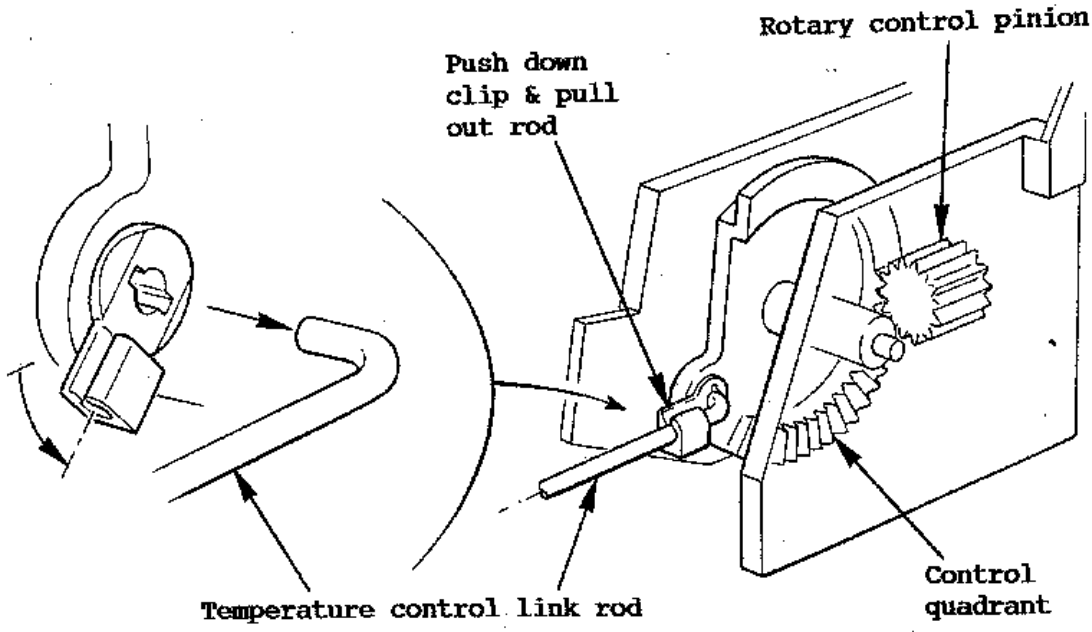
Reverse the disassembly sequence to re-assemble the cluster.

MJ.15 - INSTRUMENT/SWITCH PANEL (FASCIA MASK) REMOVAL

1. Remove the glovebox pivot pins, and glovebox. From the glovebox aperture, reach behind the radio unit and release the wing nut and washer securing the support bracket to the back of the set. Use the release forks to withdraw the radio unit, and disconnect the aerial lead, speaker harnesses, and power and earth leads.



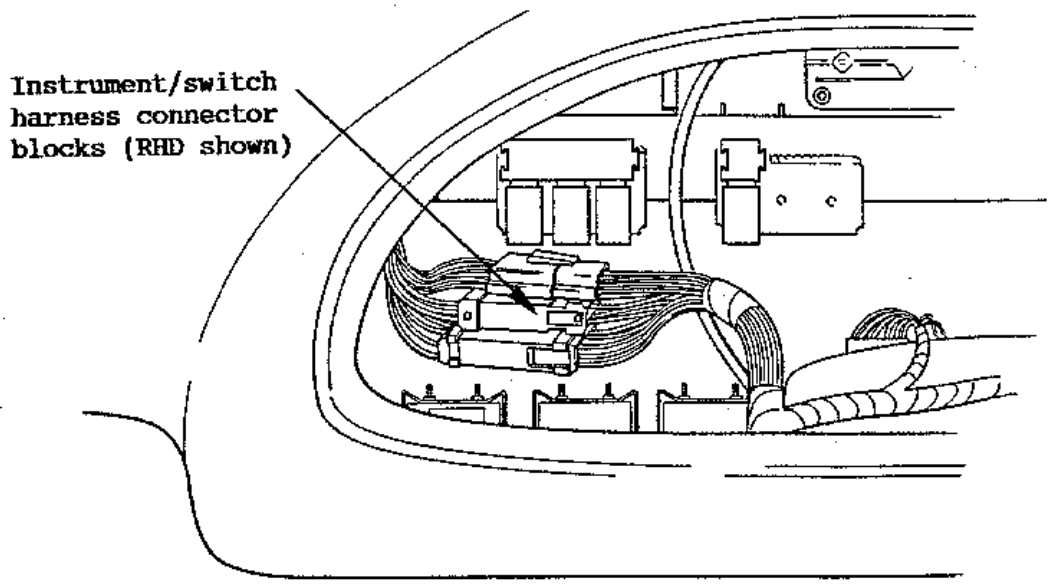
2. Reach behind the climate control panel, and unclip the temperature control link rod from the control quadrant. Also pull off the vacuum pipes connector plug from the rotary distribution control.



3. Remove the steering wheel: **For USA vehicles fitted with a Supplementary Inflatable Restraint (S.I.R.), see Service Notes Manual WB for precautions and procedure for removing the steering wheel.** On all other vehicles:
   - press the centre horn pad and turn counterclockwise to release from the bayonet type fixing;
   - remove the nut and washer retaining the steering wheel;
   - mark the reletive positions of the wheel and inner column to aid refitting;
   - pull the wheel off the column using minimum force. If necessary, use a suitable puller.
     DO NOT apply excessive axial force to either the inner or outer column without the use of a steering wheel puller, or the mechanism retaining the telescopic length of the collapsible column may be overridden, necessitating column replacement.

4. Remove the column shrouds. Press down the plastic tabs retaining the column switches, and slide the switches from their carrier bracket.

5. Release the two screws, and remove the instrument access panel from the top of the binnacle. Disconnect the speedo cable, and the three instrument/ switch harness connector blocks.

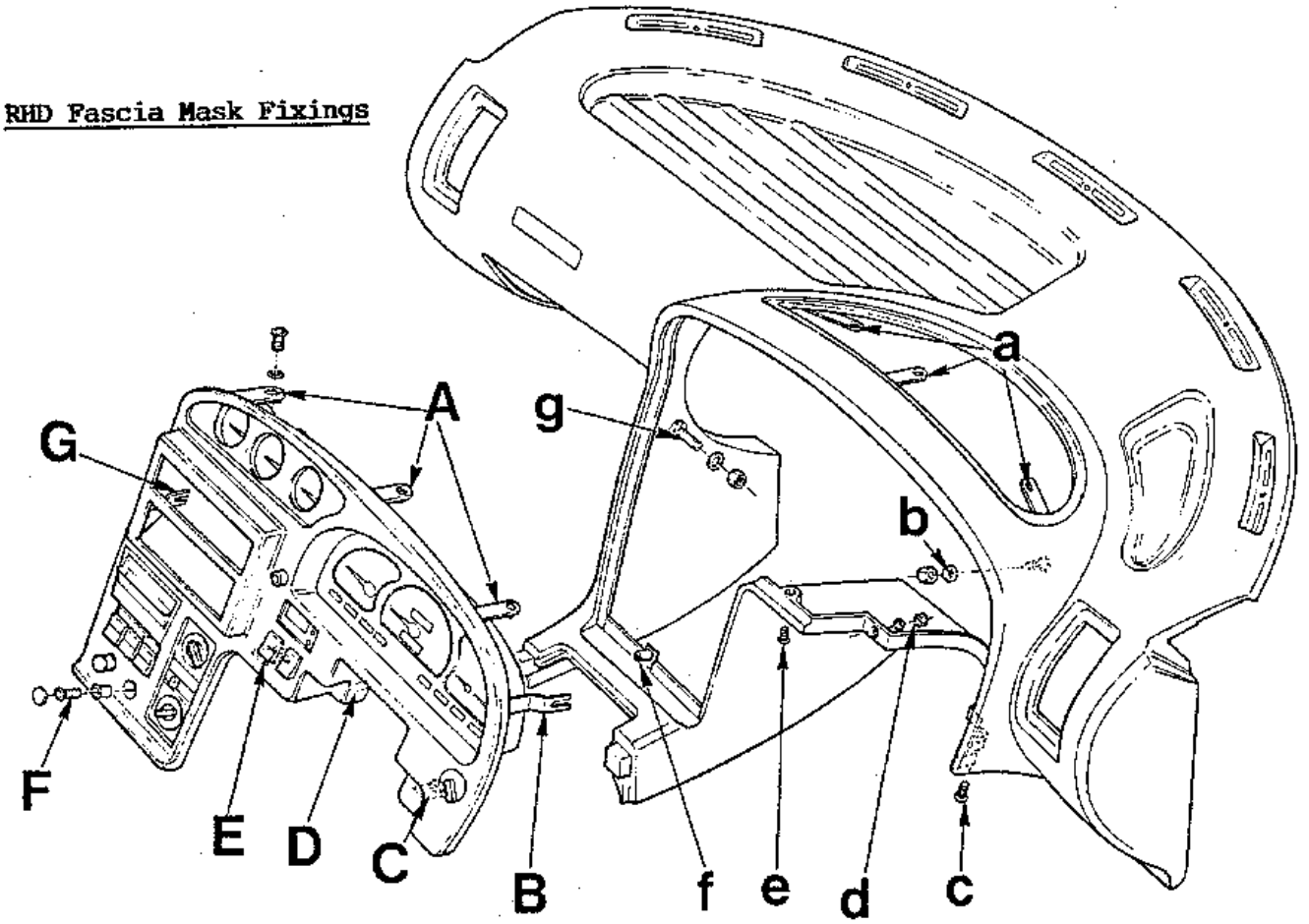


6. RHD cars

Release the nine fixings securing the fascia mask to the main fascia:

- From within the instrument cluster access aperture, remove the three screws (A), and slacken the single nut (b) securing the top edge of the fascia mask.
- Remove the two blanking plugs in the bottom edge of the driver's side fascia, and release the two fixing screws (c) and (e).
- From the underside of the fascia, release the single fixing nut (d) to the inboard side of the column.
- Remove the blanking plug at the bottom of the fascia mask adjacent to the cigar lighter, and release the lower fixing screw (F).
- From the radio aperture or the glovebox aperture, slacken the fixing at (g), and withdraw the instrument/switch panel from the main fascia.

RHD Fascia Mask Fixings

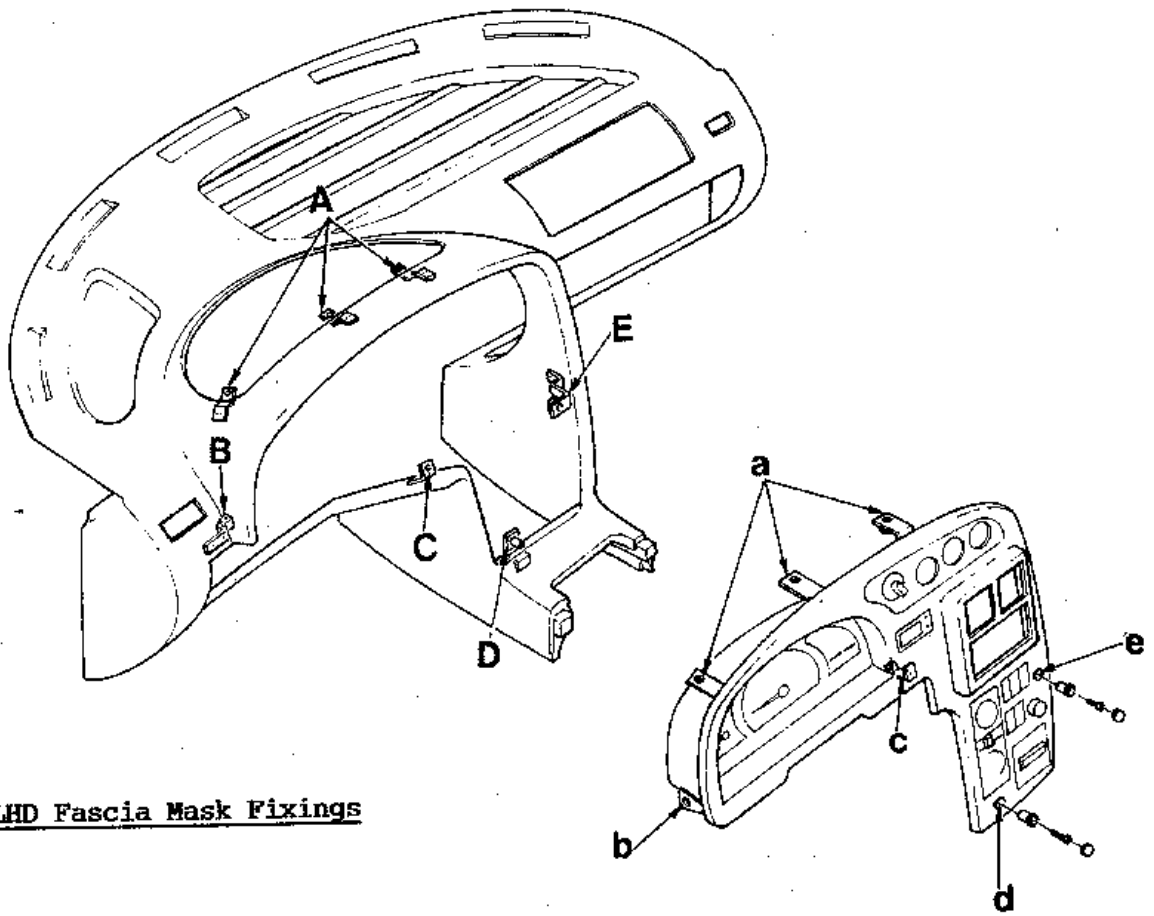


LHD cars

Before releasing the fascia mask fixings, it is necessary first to remove the driver's side fascia filler panel (non-SIR cars) or knee bolster (SIR {air bag} cars). The non-SIR type filler panel may be removed after releasing the two screws at the top of the visual face, and pulling the panel upwards. The SIR type knee bolster is removed by releasing the two nuts securing the lower edge of the bolster to the support bracket, and pulling the top edge horizontally rearwards to release the spring clips.

Release the seven fixings securing the fascia mask to the main fascia:

- From within the instrument cluster access aperture, remove the three screws (A) securing the top of the panel.
- Release the single screw fixing (B) from beneath the outboard end of the panel.
- Release the single screw fixing (C) from beneath the inboard end of the instrument panel.
- Remove the two blanking plugs from the fascia mask at the bottom LH corner, and above the cigar lighter, and release the two fixing screws (D) and (E).



LHD Fascia Mask Fixings

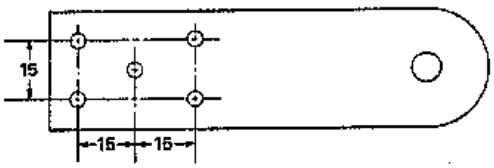
In the event that a fixing bracket should become detached from the fascia mask, refix the bracket as follows:

1. Ensure that the surfaces to be bonded are clean, dry, and free of dust, grease or loose or broken foam.

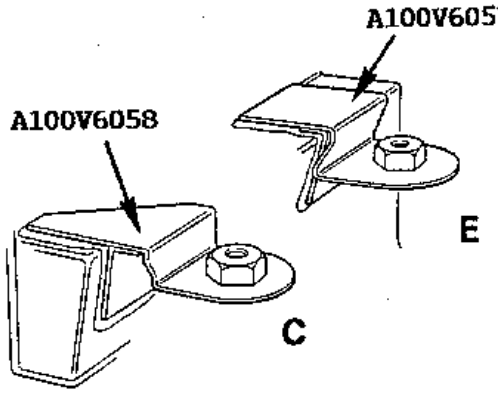
2. If not already present, drill holes 3 to 4 mm diameter in the bracket to provide a good key for the adhesive. The diagram shows a typical hole pattern for an early RHD top fixing bracket.

3. If a RHD fixing bracket at location E or C should become detached, ensure that only the later type brackets A100V6057 (inboard) or A100V6058 (outboard)

are fitted. These brackets incorporate vertical legs to spread the load over two surfaces rather than the single surface of the earlier type.



Typical hole pattern in top bracket



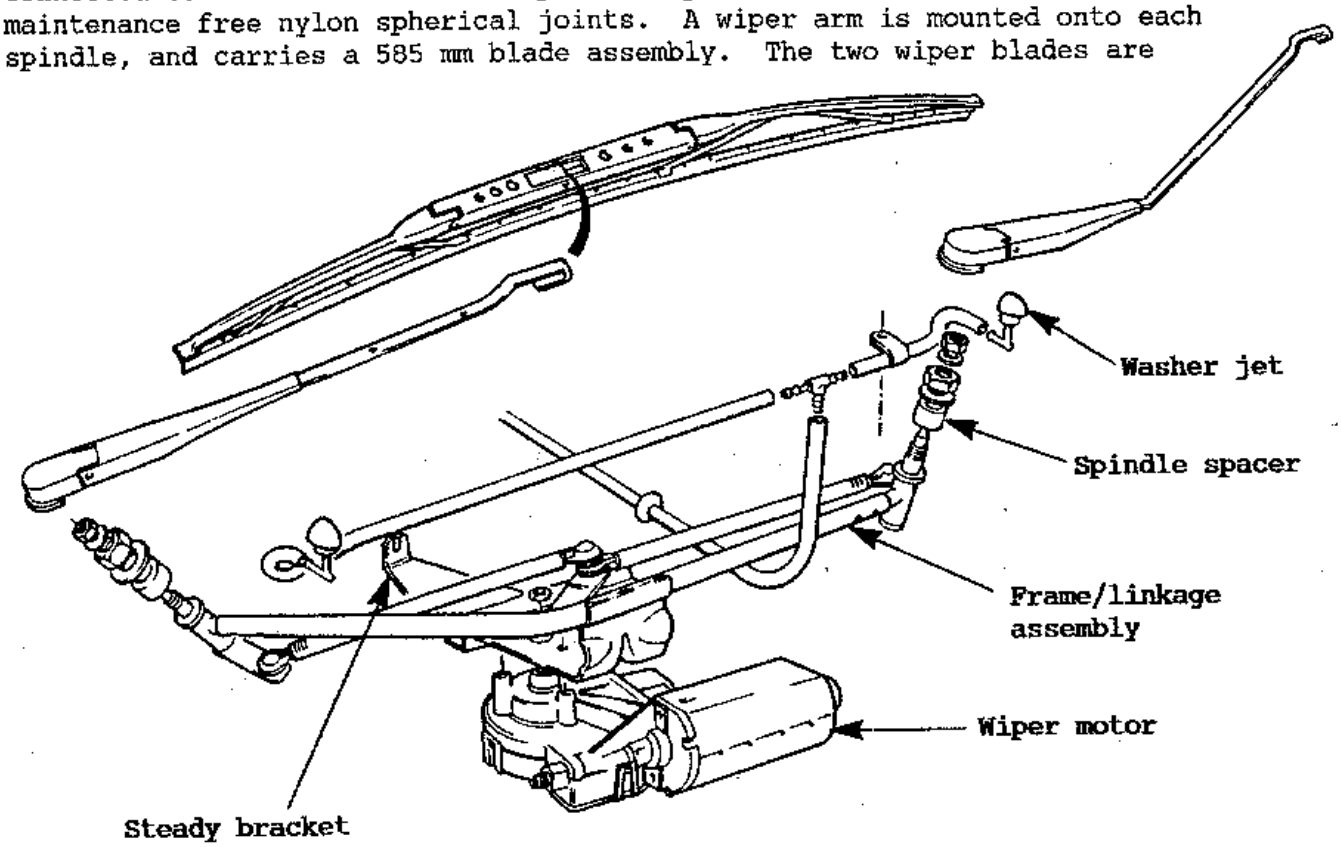
4. Bond the bracket to the fascia using Permabond 'Double Bubble' epoxy adhesive A100V6042, using the package instructions.

To refit the instrument/switch panel, reverse the removal procedure, noting the following points:

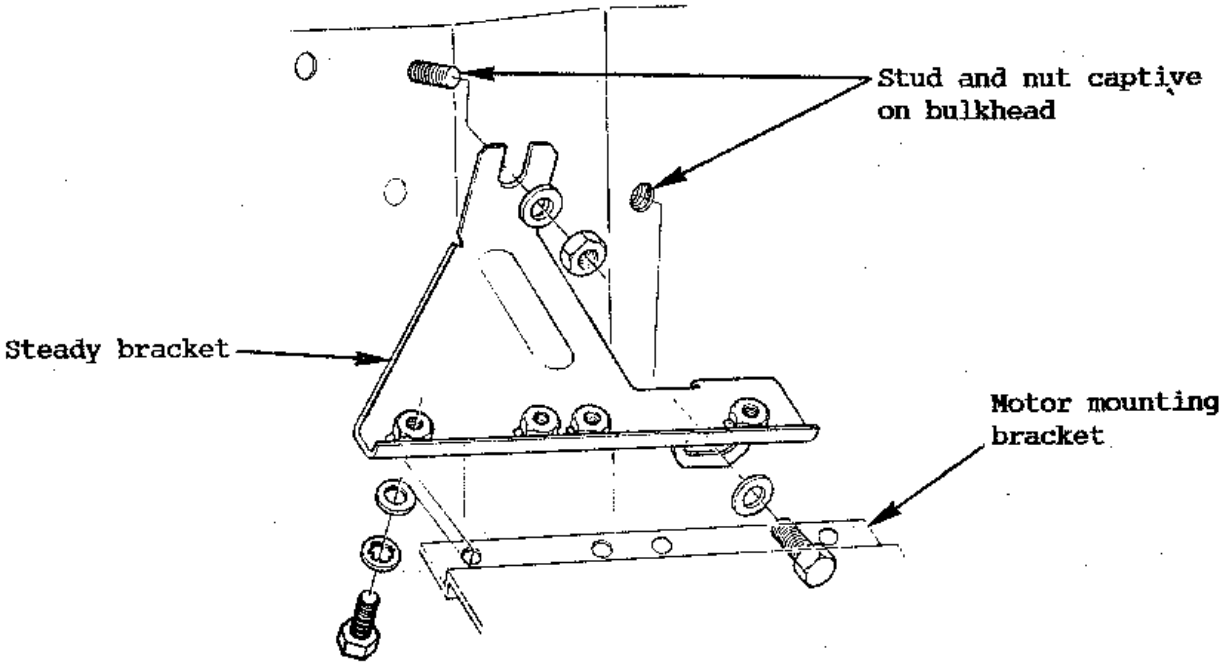
- When refitting the radio, use the access provided by the glovebox aperture to ensure that the spigot on the back of the radio engages with the support bracket fixed to the scuttle brace. Refit the washer and wingnut.
- Torque tighten the steering wheel nut to 40 Nm (30 lbf.ft).

MJ.16 - WIPER MECHANISM

The wiper mechanism consists of a two speed motor with an output crank connected to the cranks of two wiper arm spindles by rigid tubular links, using maintenance free nylon spherical joints. A wiper arm is mounted onto each spindle, and carries a 585 mm blade assembly. The two wiper blades are



identical, but the wiper arms differ, with a straight arm on the driver's side, and a cranked arm on the passenger side. The wiper spindles are carried in pivot housings which are clamped to the body, and are interconnected with each other by a tubular frame, to which the motor is also mounted. A steady bracket connects the motor mounting to the front bulkhead.



Other than the arms and blades, the only serviceable items of the wiper mechanism are the motor, and the complete frame/linkage assembly.

Removal

To remove the wiper motor from the mounting frame:

- Remove the nut securing the motor rotary link to the motor shaft, and disconnect the link from the motor.
- Release the three fixings securing the motor to the bracket, and withdraw the motor, disconnecting the harness connector plug.

To remove the wiper linkage assembly, first remove the motor as above, then:

- Remove both wiper arms.
- Remove the spindle nuts and washers.
- Remove the four screws and washers securing the linkage assembly to the bulkhead mounting bracket.
- Ease the spindles out of their body holes, and remove the linkage assembly from the car. On RHD cars, first slide the assembly towards the RH wheelarch (release the wheelarch liner if necessary) to enable the left hand spindle to be lifted over the engine.
- If necessary, remove the bulkhead bracket after removing the single M8 setscrew, and loosening the M8 nut (open slot in bracket). Note that the stud plate/tapping plate is secured to the inside of the bulkhead with Betamate adhesive.

To refit the assembly (with mounting bracket fitted to bulkhead):

1. Secure the mounting bracket to the bulkhead, and tighten the two fixings.

2. Check that the 5mm spacer is fitted over each spindle before feeding the mechanism behind the engine, and locating the spindles through their body holes. Fit the rubber washer, plain washer and nut to each spindle housing,

and fit the four M6 screws and washers securing the mechanism to the mounting bracket. Torque tighten the spindle nuts to 5 Nm (3.7 lbf.ft), and tighten the M6 screws.

3. Plug in the wiper motor connector block as the motor is fed into position, and fit the three bolts securing the motor to the mounting bracket. Switch the wiper control on and off in order to 'park' the motor. Ensure that each wiper spindle arm is pointing forwards before fitting the rotary link onto the motor shaft, with the link pointing towards the driver's side, and at 'bottom dead centre' with the movement of the tubular links about to change direction. Fit the rotary link retaining lockwasher and nut, and torque tighten to 15 - 20 Nm (11 - 15 lbf.ft) whilst resisting the torque by holding the rotary link. i.e. do not allow the tightening torque to be transmitted through the motor gears.

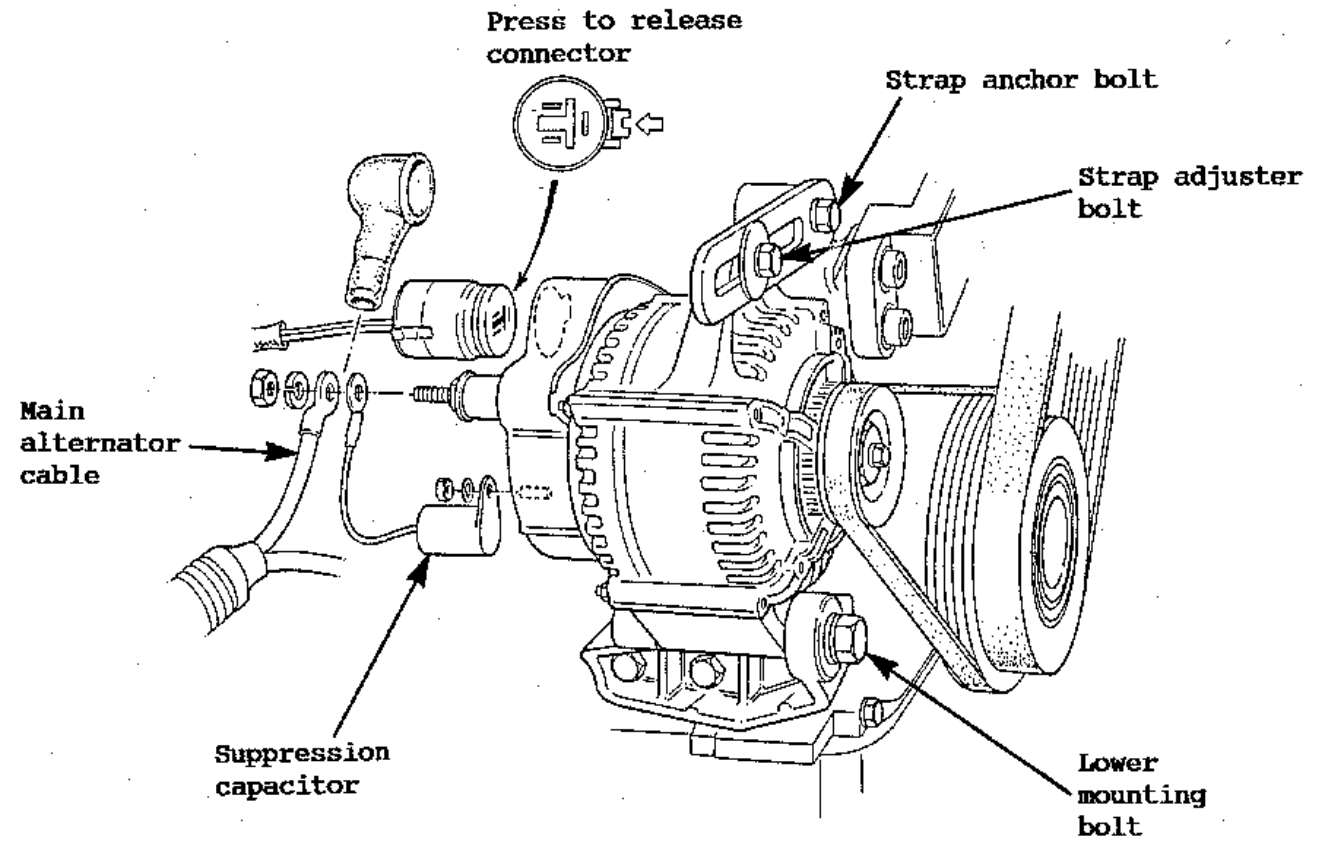
4. Fit the wiper arms (straight arm on the driver's side, angled arm on the passenger side) to their spindles in the park position, and retain each with its shakeproof washer and nut. Tighten to 20 Nm (15 lbf.ft).

5. Check the operation of the wipers on a wet screen.

MJ.17 - ALTERNATOR

The 12 volt 60 amp alternator is mounted on the rear side of the engine, and is driven by multi-vee belt from the front end of the crankshaft. The correct belt tension is 41 ± 9 kg (90 ± 20 lbf) using a Burroughs gauge.

To adjust the belt tension, slacken the lower mounting bolt, strap anchor bolt, and adjuster slot bolt, move the alternator to achieve the correct tension, and retighten all fixings. Recheck belt tension after tightening the bolts.



To remove the alternator;

1. Disconnect the battery.

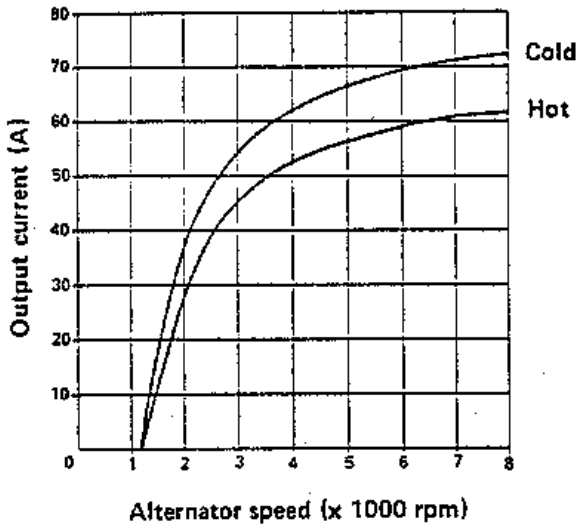
2. Disconnect the main cable from the alternator after releasing the retaining nut. Release the electrical connector plug by pressing the retaining tab at the engine side of the plug, and withdrawing. Remove the oil filter if necessary for improved access.

3. Release the bolt securing the top of the alternator to the adjuster strap, and the lower pivot bolt fixing the alternator to the mounting bracket. Release the two bolts securing the mounting bracket to the block, and remove the bracket.

4. Withdraw the alternator.

To refit the alternator, reverse the removal procedure, and tension the drive belt as detailed above.

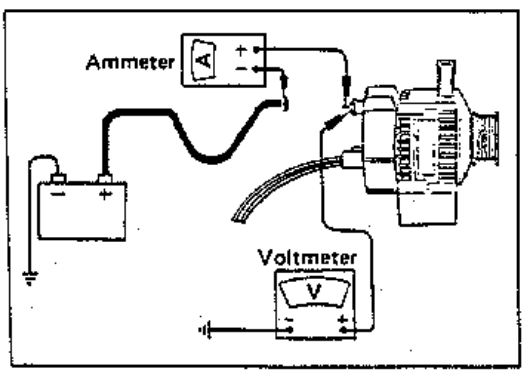
Output Characteristics



Checking Alternator Output

1. Disconnect the output terminal of the alternator, and connect an ammeter between the main lead and the output terminal, with the meter +ve lead to the alternator. Run the engine at 2080 rpm and check the ammeter reading.

Standard amperage = 9 - 11 amps



2. Switch on the headlamp main beams, air conditioning and fast speed blower fan. Run the engine at 2080 rpm and check the ammeter reading.

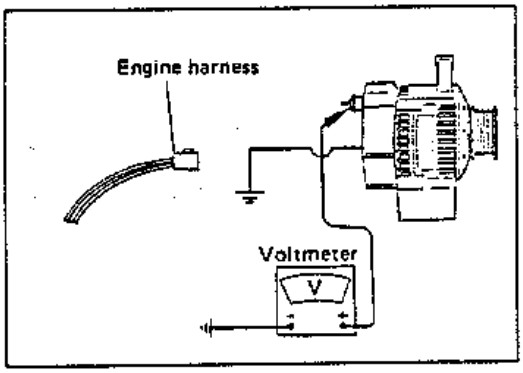
   Specific amperage = more than 60 amps

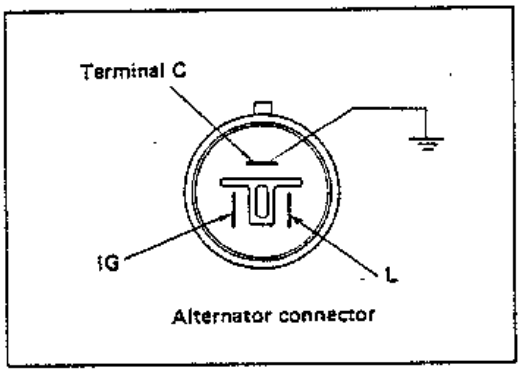
3. Switch off all electrical loads. Connect the +ve lead of a voltmeter to the alternator output terminal, and the voltmeter negative lead to ground. Run the engine at 2080 rpm, and check the voltmeter reading.

   Regulated voltage = 14.2 - 14.8 volts

4. Disconnect the harness connector block from the alternator. Connect the +ve lead of a voltmeter to the output terminal, and the voltmeter -ve lead to earth. Earth alternator terminal C. Run the engine at 2080 rpm, and check the voltmeter reading.

   Regulator voltage = 12.5 - 13.1 volts





If any meter readings are outside of specification, the alternator should be repaired by a competant auto-electrician, or replaced.

MJ.18 - STARTER MOTOR

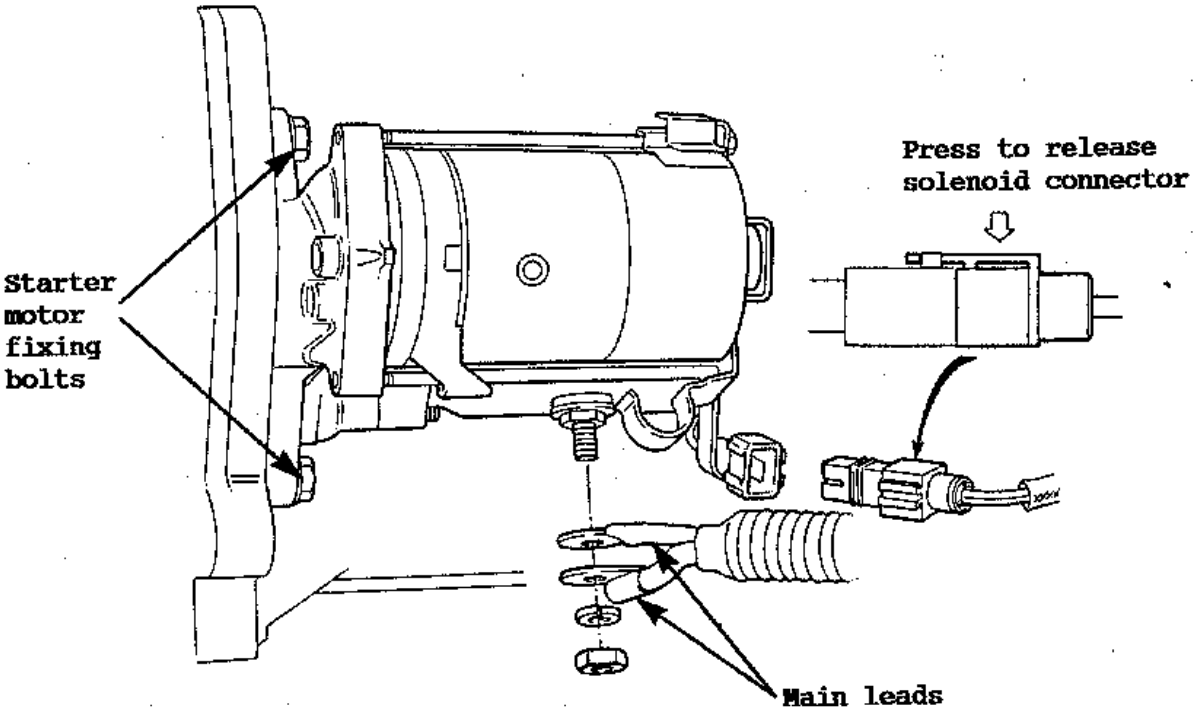
The pre-engaged type starter motor, fitted at the rear side of the engine, uses reduction gearing, and an overrunning clutch.

To Remove

1. Disconnect battery.

2. Remove the engine bay underframe:
   - Disconnect the LH fan harness, and release from underframe 'P' clip.
   - Release the three M6 setscrews securing the front end of the underframe to the radiator support frame.
   - Release the engine front damper from the underframe. Note the spacer washers.
   - At each rear end of the underframe, release the 2 bolts securing the underframe to the chassis front crossmember, 2 nuts and bolts securing the underframe to he support strut, and the single nut (and bolt) securing the underframe/raft/strut.
   - Withdraw the underframe.

3. Unplug the solenoid lead by pressing the release tab as shown. Disconnect the main leads after removing the retaining nut and washer.



4. Remove the oil filter, and disconnect the exhaust pipe joint beneath the engine to provide room to withdraw the motor.

5. Release the two starter motor fixing bolts, and withdraw the motor assembly.

To refit the starter motor, reverse the removal procedure and refit the underframe as follows:

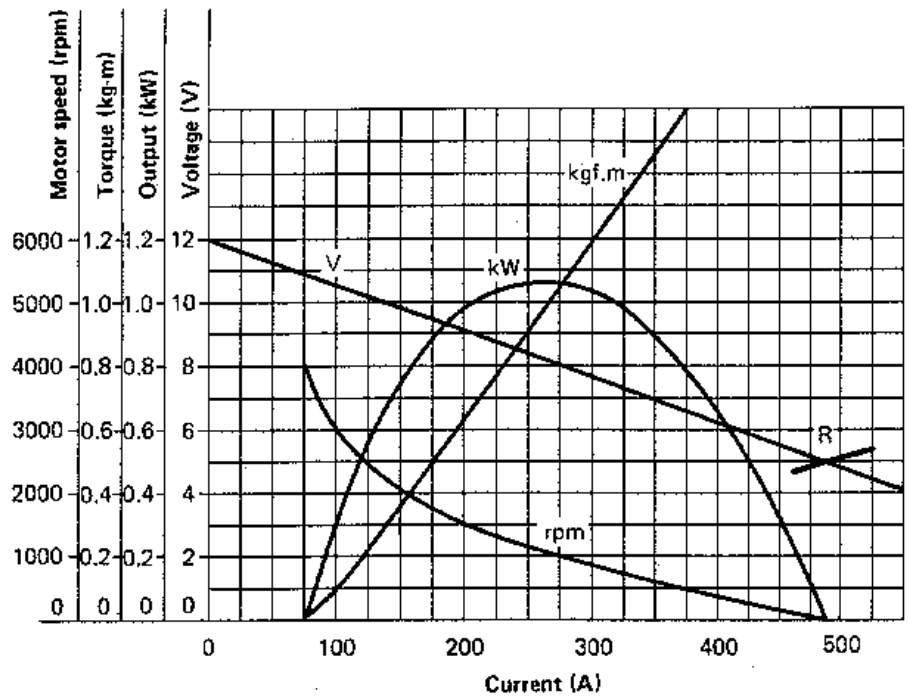
- Apply thread locking compound to the 4 bolts securing the underframe to the chassis front crossmember (also take care not to crossthread these bolts), and to the three M6 setscrews at the front end of the underframe.
- Fit underframe into position, and support by loosely fitting the two nuts and washers on the underframe/raft/strut bolts.
- Fit 3 setscrews, with thread locking compound applied, at front end of underframe into radiator support frame, and nip up.
- Ensure both rear ends of the underframe are pressed against the chassis before inserting the 4 rearmost bolts, with thread locking compound applied, taking care not to crossthread.
- Fit the remaining 4 underframe to strut bolts with nyloc nuts uppermost.
- Progressively tighten all bolts:
  M14 bolts to 75 Nm (55 lbf.ft)
  M6 screws to 10 Nm (7.5 lbf.ft)
- Fit a thick washer each side of the engine damper lower eye and tighten fixing bolt to 24 Nm (18 lbf.ft).
- Re-connect the fan harness, and secure harness in 'P' clip.

Starter Motor Main Data

Rated voltage	12 V
Rated output	1.2 Kw
Rated time	30 secs.
No. of pinion teeth	9

Direction of rotation	Clockwise (viewed from pinion end)
No load characteristics:	
- Voltage/current	11.5V/90A or less
- Speed	3,000 rpm or less
Load characteristics:	
- Voltage/current	8V/280A
- Torque	1.0 kgf.m
- Speed	900 rpm or more
Locking characteristics:	
- Voltage/current	2.5/400 or less
- Torque	1.1 kgf.m or more
Magnetic Switch @ 20°C:	
- Series coil resistance	approx 0.35 ohms
- Shunt coil resistance	approx 1.08 ohms

Output Characteristics



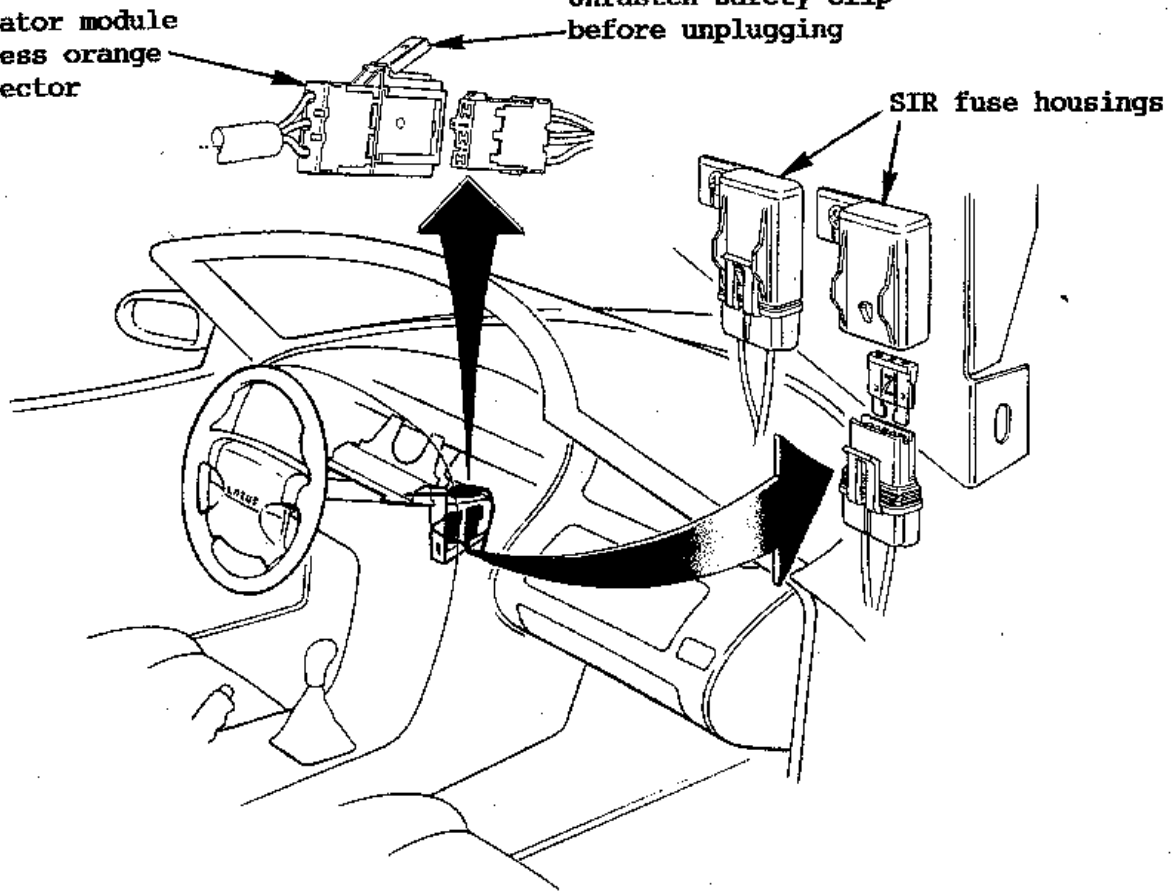
MJ.19 - SAFETY PRECAUTIONS FOR SUPPLEMENTARY INFLATABLE RESTRAINT (S.I.R.) MODELS

The Diagnostic Energy Reserve Module (DERM), a key component in the SIR system, can maintain sufficient voltage to cause air bag deployment for up to 10 minutes after the ignition is turned off and the battery disconnected. As a safety measure, before carrying out ANY electrical maintenance or diagnostic work, the following procedure MUST be adopted in order to disable the SIR system:

1. Turn off the ignition.

2. From within the driver's footwell, remove the two SIR fuses from their holders fixed to the knee bolster support bracket.

3. Unplug the orange 3-way connector to the inflator module alongside the steering column.



When all service work is completed, the following procedure should be adopted:

1. Reconnect the orange 3-way connector between SIR harness and steering column.

2. Refit the two SIR fuses.

3. Conduct 'SIR Diagnostic System Check' as follows:
   - Turn on the ignition and observe the SIR tell tale; it should flash seven to nine times and then go out. When the engine is cranked, the lamp should come on steady, and then flash for another seven to nine times after the engine has started.

WARNING: If the SIR tell tale lamp does not come on with the ignition, and follow the sequence detailed above, or if it lights at any other time, a fault in the SIR system is indicated which should be investigated without delay (see section WB.4 of the SIR Service Notes) as the SIR may not function correctly.

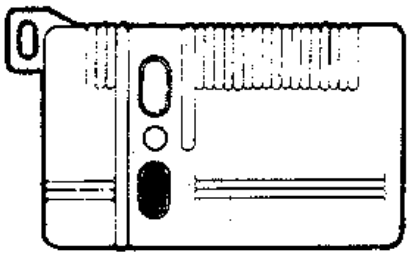
MJ.20 - ALARM SYSTEM

The Lotus Elan vehicle alarm system is specifically tailored to the Elan, and provides theft protection of the car and contents in addition to remote control of the central locking. The kit, which may be fitted only by Lotus dealers, contains all the necessary parts, including model specific wiring harnesses, fettling templates, fitting instructions and an owner's handbook supplement.

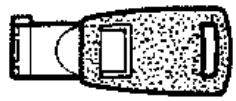
OPERATING INSTRUCTIONS

The Lotus vehicle alarm system provides theft protection of the car and contents as well as remote control of the central locking by a hand held transmitter key. When the alarm is triggered, the vehicle horns and a separate high pitched siren will sound on/off, and the hazard lights flash, for a period of 30 seconds before the alarm switches off and automatically resets. Two pairs of keys are supplied with the alarm;

Transmitter Key

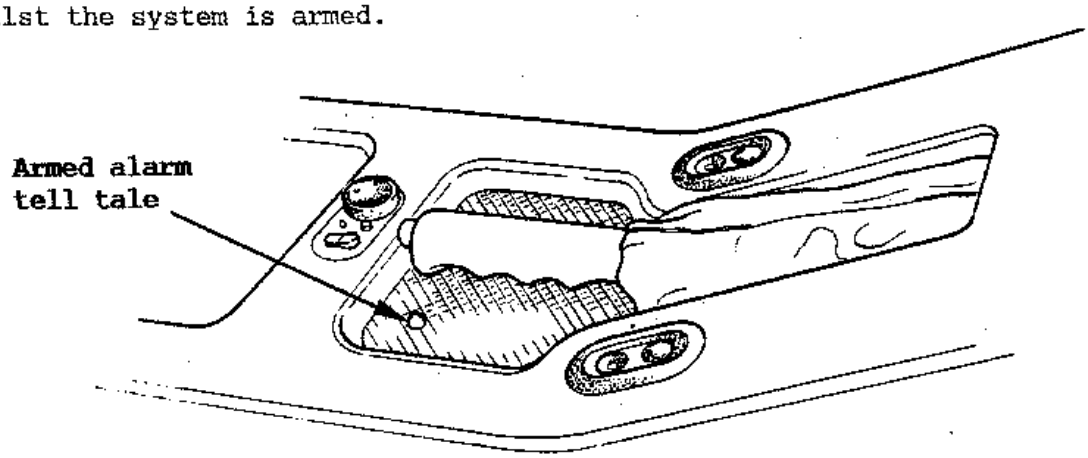


Master Key



The transmitter key number is recorded on a label stuck to the key, and the master key number is stamped on a plate supplied with the keys. The owner should make a note of these numbers before removing them from the keys, and keep a record of them with the vehicle documents to enable replacement keys to be ordered if necessary. The master key should be kept safe and separate from the transmitter key, so that in the event of transmitter key loss, the system can be de-activated (see later).

To arm the system; shut both doors and boot lid (the roof may be either raised or stowed), and press the BLACK button on the transmitter key. The central door locking will be activated to lock both doors, and the arming signal will be acknowledged by a single flash of the hazard lamps. In addition, a small red light in the recess beneath the parking brake lever, will flash continuously whilst the system is armed.



After the arming time has elapsed (see below), the alarm will be triggered by any of the following:

- opening either door;
- opening the boot lid;
- energising the ignition system (with the key or by 'hot wiring');
- movement within the cabin detected by a microwave sensor.

After the arming signal is made, a delay of 40 seconds will occur before the door switches and microwave sensor become armed, with a 5 second delay applying for the boot lid and ignition system sensors.

If a triggering signal is present before the arming signal is made (e.g. door open), or if a door or bootlid is opened, or the ignition energised within the arming delay period, the alarm will be triggered when the delay period has expired. It is not possible to arm the alarm once the ignition is switched on.

Note: Do not leave coins or keys in the recess beneath the parking brake lever, or the operation and sensitivity of the microwave sensor (which is located beneath this trim panel) will be affected.

To disarm the system; press again the BLACK button on the transmitter. If the alarm had not been triggered since last arming, the disarming signal will be acknowledged by the hazard lamps flashing three times. If the hazard lamps flash five times, this is an indication that a break in had been attempted.

If the alarm is triggered continuously by a door switch, boot lid switch or the microwave sensor, (e.g. the door is opened and then left open) the alarm will operate for 30 seconds, switch off for 10 seconds, and repeat for three cycles before switching off and resetting for triggering by a different signal. In the case of an ignition line trigger, the alarm will cycle continually.

The sensitivity (range) of the microwave sensor can, if necessary, be adjusted by the dealer. The range of the transmitter key will vary from over 25 metres to a lesser distance, depending on the state of the transmitter battery, which must be replaced periodically. See below.

Panic Alarm: If, when the system is armed, the red button on the transmitter key is pressed, the alarm will be triggered for 10 seconds. Pressing the red button a second time will switch off the panic alarm. This feature may be used to attract attention in an emergency. Operation of the panic alarm does not affect the status of the theft alarm which will remain armed.

To De-activate Alarm

The alarm can be de-activated by using the master key to turn clockwise the switch on the speaker trim panel behind the right hand seat. Note that when this switch is turned back on, the alarm will automatically be armed after a five second delay; have the transmitter key handy to disarm the system using the black button.

Battery Re-connection

Note that whenever the main vehicle battery is re-connected, the alarm will automatically be armed after a five second delay (unless the system is de-activated with the master key). Have the transmitter key handy to disarm the system using the black button.

Alarm Transmitter Key Battery

At approximately twelve month intervals, the battery in the alarm transmitter key should be replaced. Remove the single screw and separate the two halves of the transmitter. Fit a new 12 volt alkaline lighter battery, type GP 23A or equivalent, and re-assemble the transmitter.

FITTING INSTRUCTIONS

Parts Required	Part No.	Qty
Alarm Kit - U.K.	A100M6147S	1
- France	A100M6148S	1
- Germany	TBA	1
- Belg, Holl, Sweden, Austria, Lux.	A100M6150S	1
- USA	A100M6149S	1
- Canada	TBA	1
Alarm Harness (not USA)	A100M0265S	1
Fixings Kit - RHD	A100M6146S	1
- LHD	A100M6151S	1

All the countries listed above have specific requirements regarding the frequency of alarm transmitter signals. When ordering a kit for a country not listed above (always specify the country), any of the kits may be supplied.

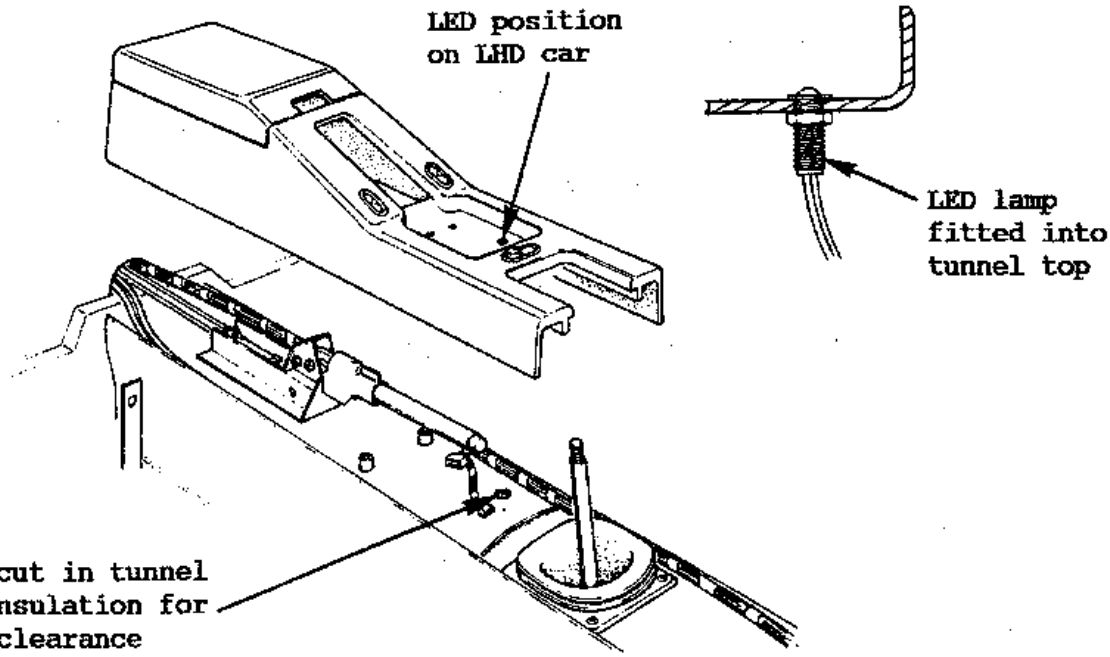
Note: - The alarm harness is designed to use the accessories power supply plug and relay provided in the standard vehicle harness. If this has already been used, e.g. for a cellular telephone, then an alternative power supply must be used for that accessory, and the standard fitment plug and relay used for the alarm installation.
- All USA cars are built with the alarm harness included but not connected, so that in the following instructions, reference need be made only to the connection of the harnesses and the fitment and connection of the alarm components.

1. Disconnect battery.

2. Remove the centre tunnel trim, the hood stowage compartment floor, the RH speaker trim panel, and on LHD cars, the LH speaker trim panel.

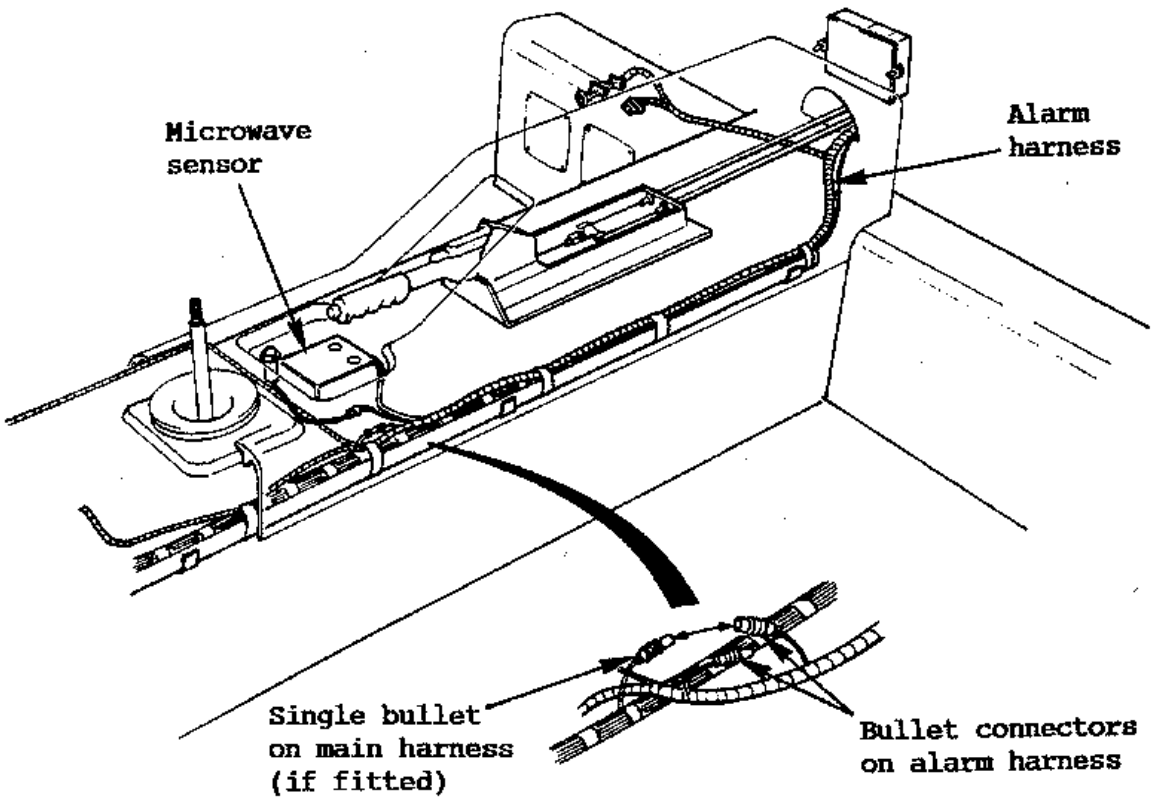
3. Remove the mat from the centre tunnel parking brake recess, and use the template provided in the kit to drill three 8mm holes for the LED tell tale, and microwave adjuster screw/LED.

4. Fit the LED light into the front hole, and retain with the nut on the underside of the recess. Remove a small piece of tunnel top insulation to provide clearance for the lamp.



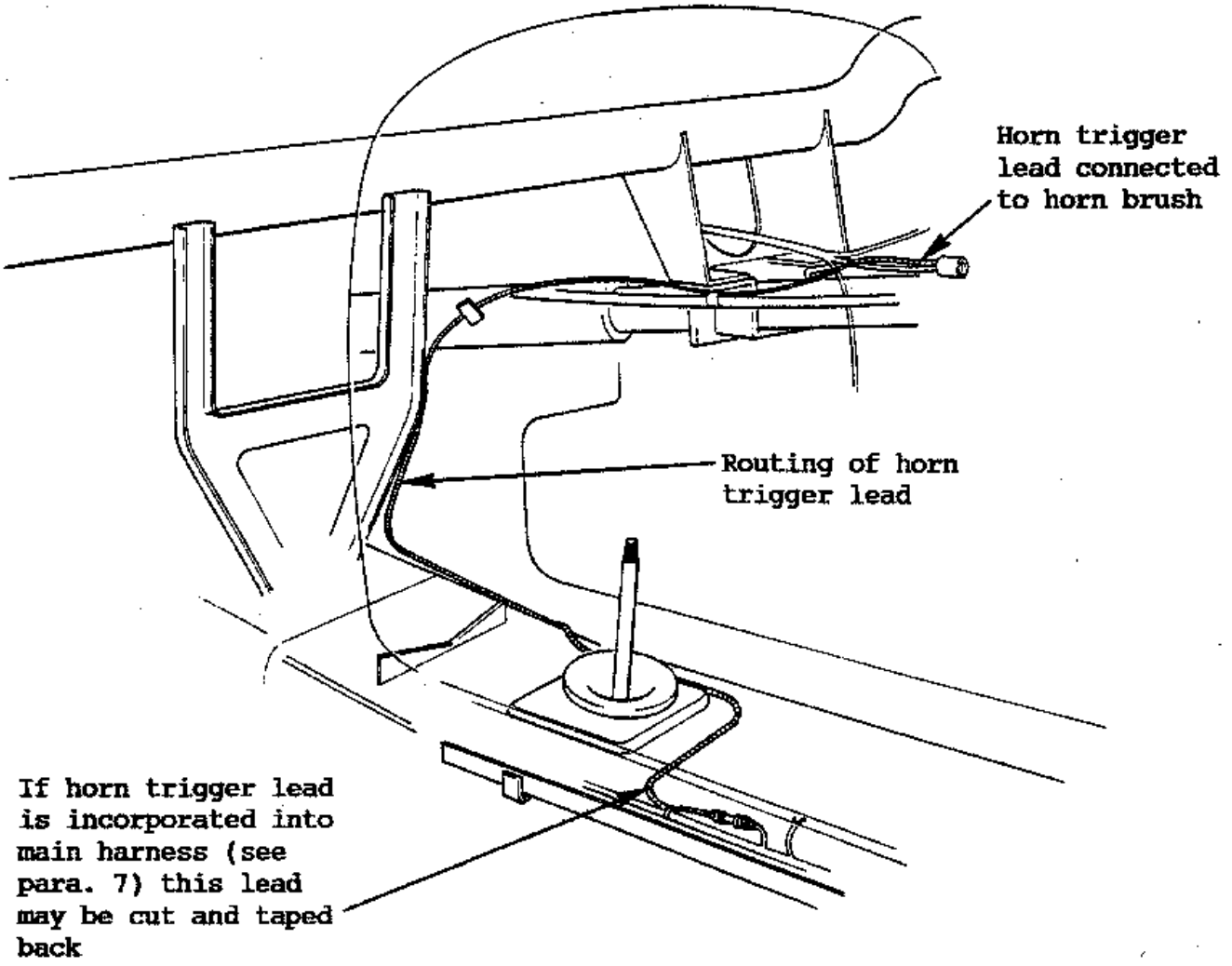
5. Apply a small piece of double sided tape to the top of the microwave sensor, and stick to the underside of the tray so that the adjuster access holes are aligned. Apply a large piece of double sided tape to the underside of the microwave sensor, and clean the corresponding surface of the tunnel top insulation. Temporarily refit the tunnel trim to stick the microwave sensor to the tunnel top. Remove the tunnel trim, and the tape from the top of the sensor. The microwave sensor should now be stuck to the tunnel top so that when the trim is fitted, the sensitivity adjuster holes are aligned.

6. Route the alarm harness and microwave sensor lead along the tunnel top alongside the main harness, and feed beneath the cabin rear wall into the battery compartment. Tape to the main harness.



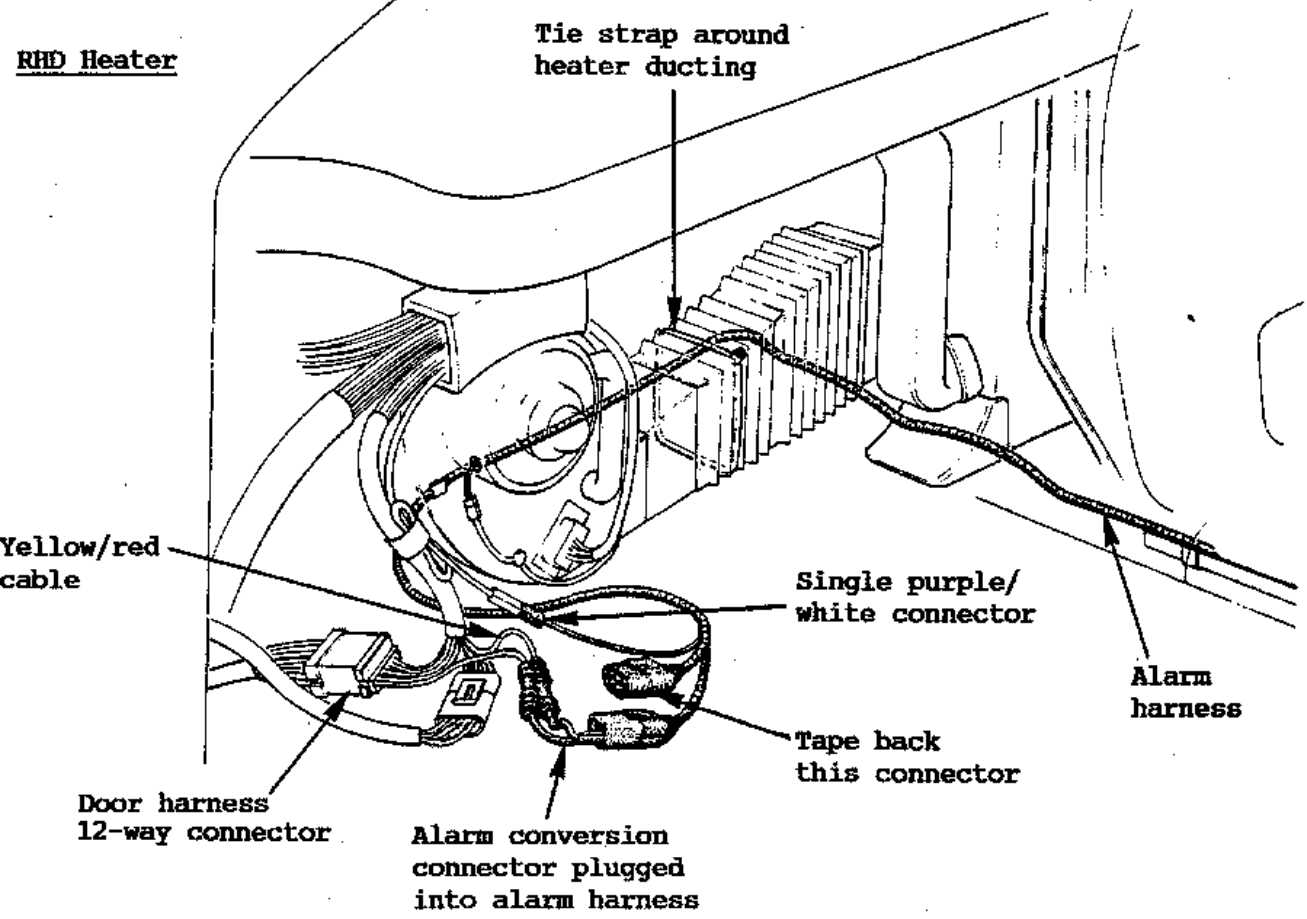
7. All LHD cars and later RHD cars have a horn trigger lead incorporated into the main harness, with a single bullet connector emerging from the main harness just to the rear of the gear lever. Unplug the adjacent bullet connection in the alarm harness, and mate with this main harness lead. The horn trigger lead on the alarm harness (purple/black wire in sleeve) may then be cut and taped back.
On RHD cars where this lead is not incorporated, route the alarm harness horn trigger lead across the tunnel top behind the gear lever, and then forward, pushing the lead up underneath the lower edge of the fascia trim at the inboard side of the driver's footwell.

8. Remove the lower half of the steering column shroud and feed the horn trigger lead up the column alongside the ignition switch harness. Disconnect the horn switch lead from the slip ring contact, and cut off the terminal. Join with the alarm harness trigger lead, and re-terminate with the new terminal supplied. Crimp and fit heat shrink insulation before reconnecting to the brush contact. Refit the column shroud.

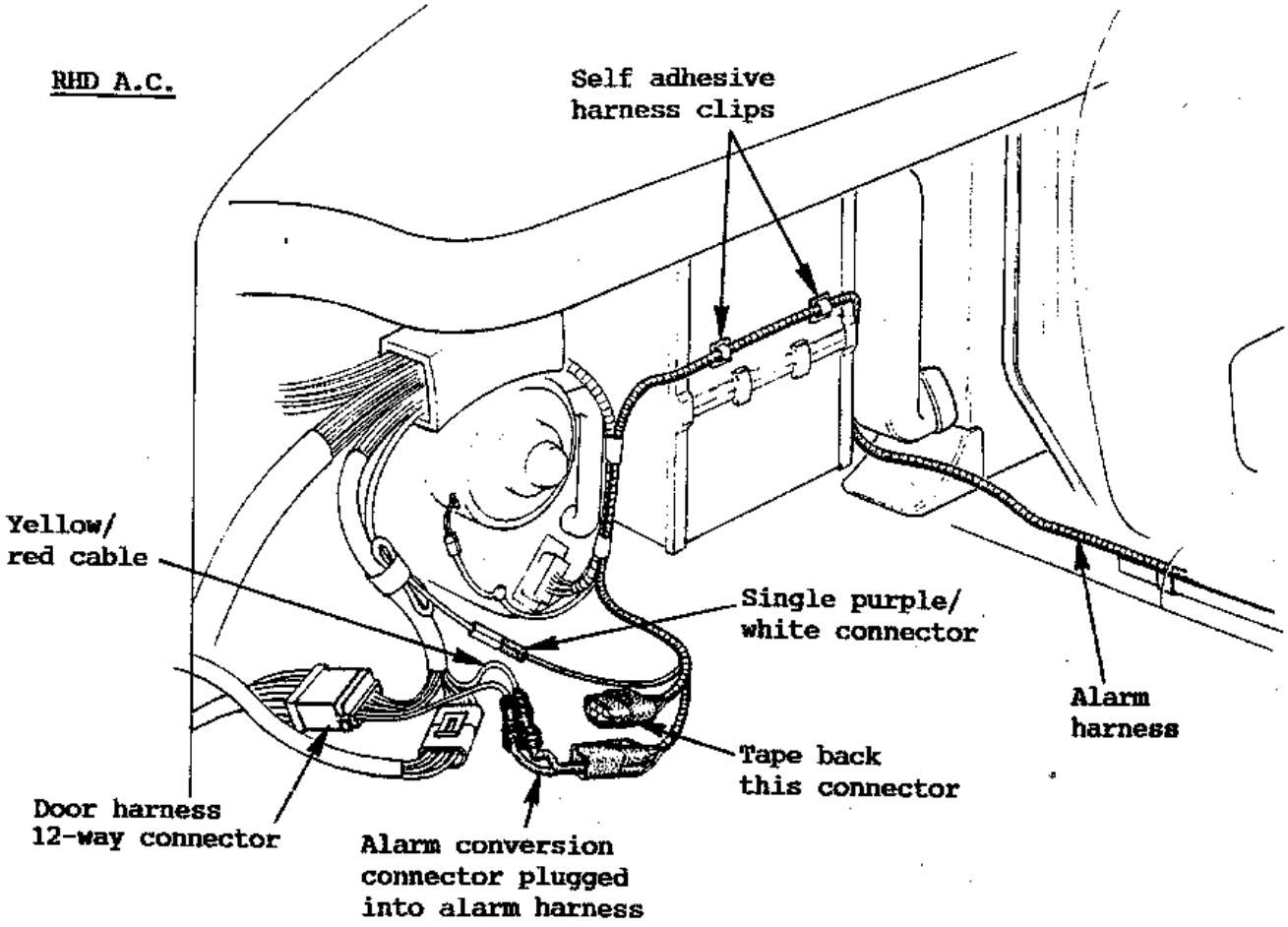

Horn trigger lead connected to horn brush
Routing of horn trigger lead
If horn trigger lead is incorporated into main harness (see para. 7) this lead may be cut and taped back

9. Route the front part of the alarm harness alongside the tunnel top main harness, pushing up behind the fascia trim at the inboard side of the LH footwell. Route and secure the harness across to the LH door hinge post area as shown in the diagrams, removing the instrument binnacle access hatch on LHD cars, and dropping the glovebox on RHD vehicles.
On all cars, including USA specification vehicles, at the the LH door harness 12-way connector, ahead of the LH door hinge post, locate the yellow/red cable in the main harness and cut the cable 30 mm from the block connector. Fit the male single terminal to the cable from the block connector, and the female to the cable from the harness. Mate these two cables to the alarm conversion connector, and plug into the corresponding connector on the alarm harness. Also connect the single purple/white lead on the alarm harness to the previously unused purple/white adjacent to the door harness connector. Tape back the remaining connector block on the alarm harness.

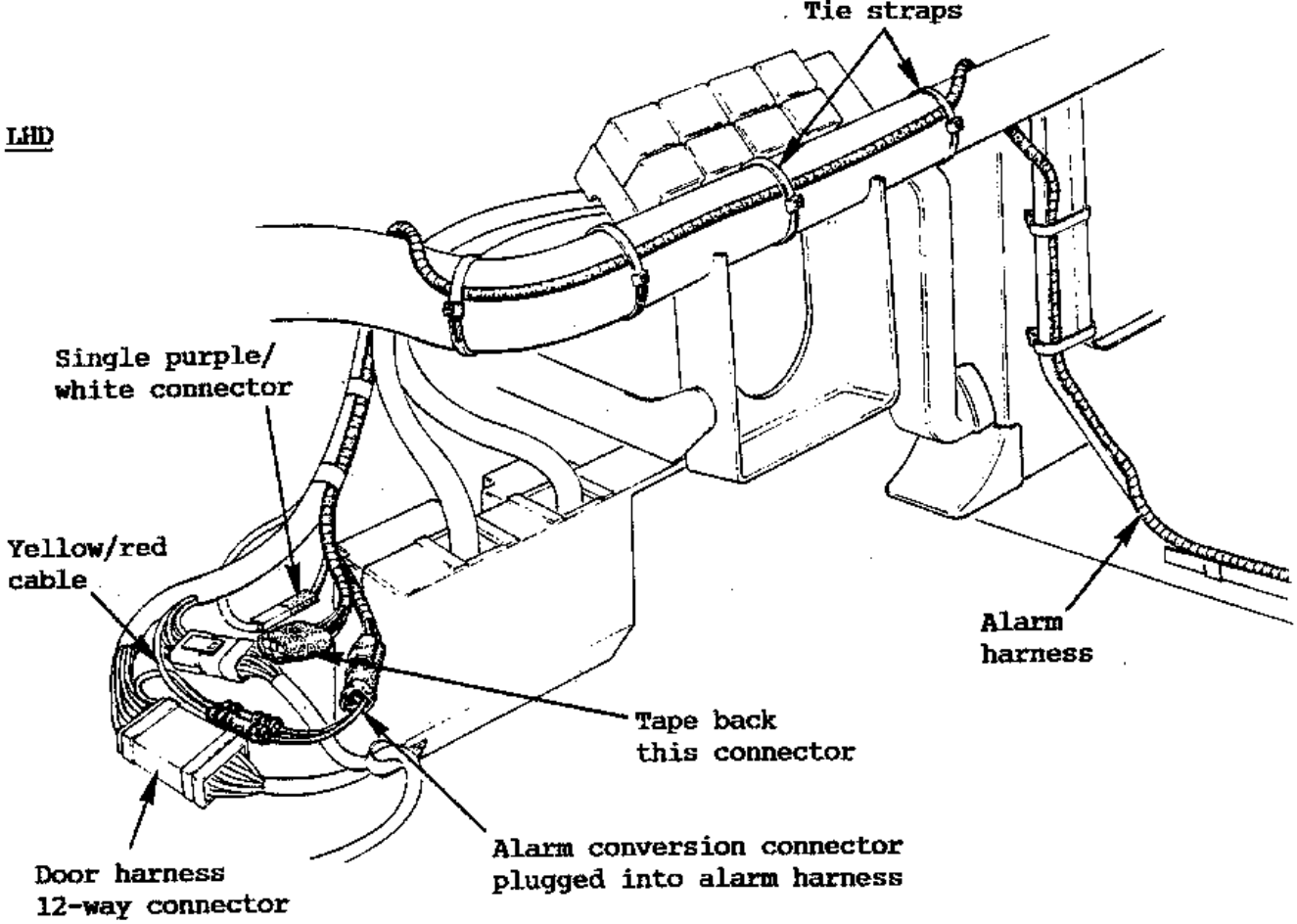
RHD Heater


Tie strap around heater ducting
Yellow/red cable
Single purple/ white connector
Alarm harness
Tape back this connector
Door harness 12-way connector
Alarm conversion connector plugged into alarm harness

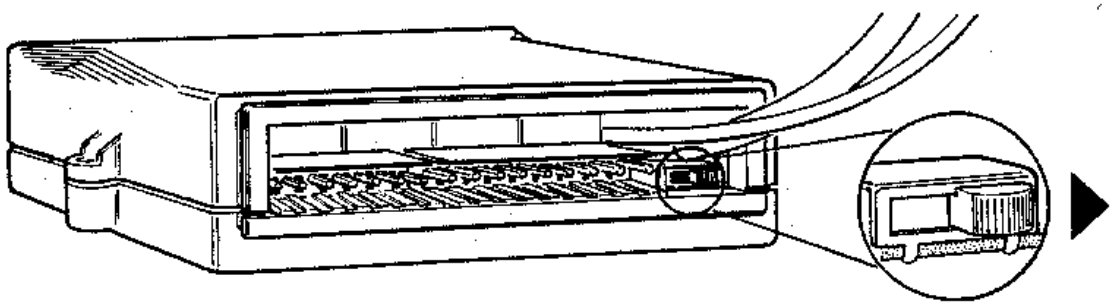
RHD A.C.

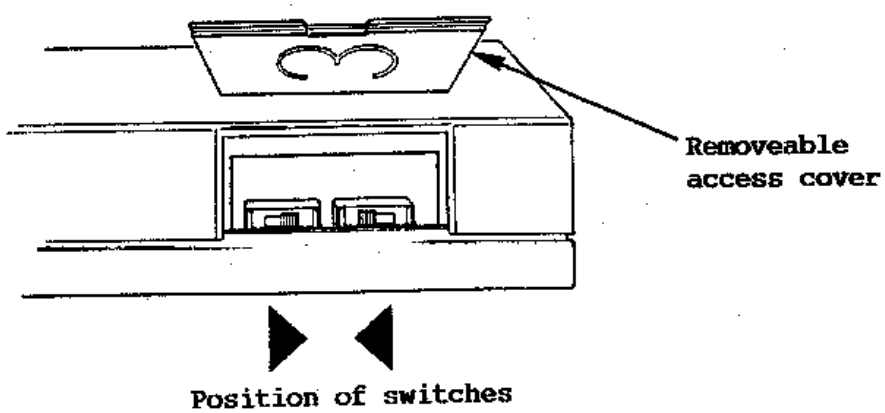

Self adhesive harness clips
Yellow/ red cable
Single purple/ white connector
Alarm harness
Tape back this connector
Door harness 12-way connector
Alarm conversion connector plugged into alarm harness

LHD

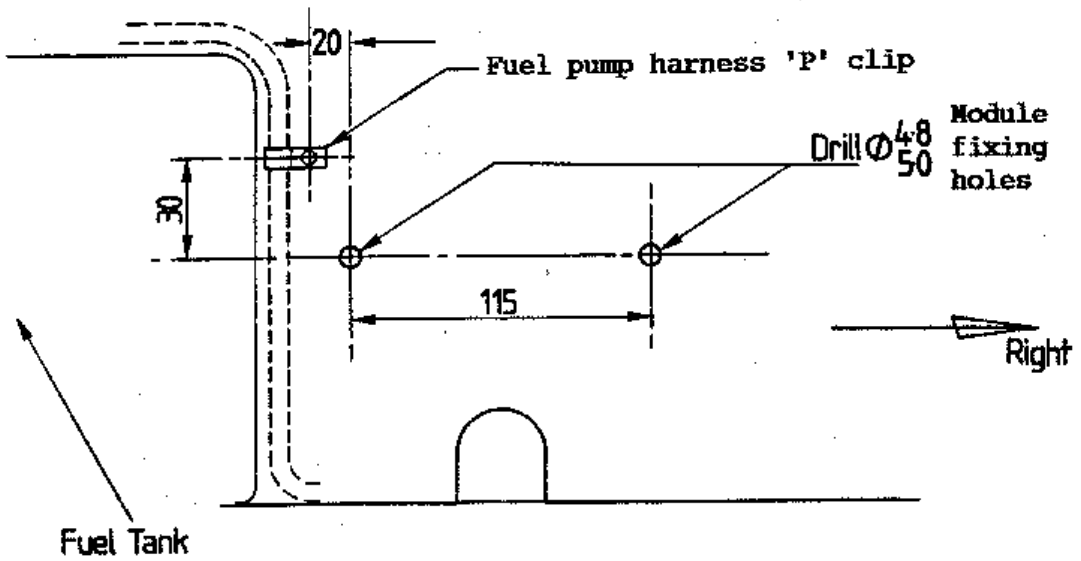


10. Fit the control module: Cut the green/yellow wire from the back of the alarm harness control module connector block, and tape back. Check that the three switches on the module are set correctly as shown in the diagram.





Plug in the module jump harness.
If the module fixing holes are not already drilled in the cabin rear wall, mark up and drill the fixing holes using the fuel pump harness 'P' clip as a reference point. Fit the module on the rear side of the cabin wall with the terminals downwards, and secure with screws from inside the map pocket using a dumpy screwdriver.

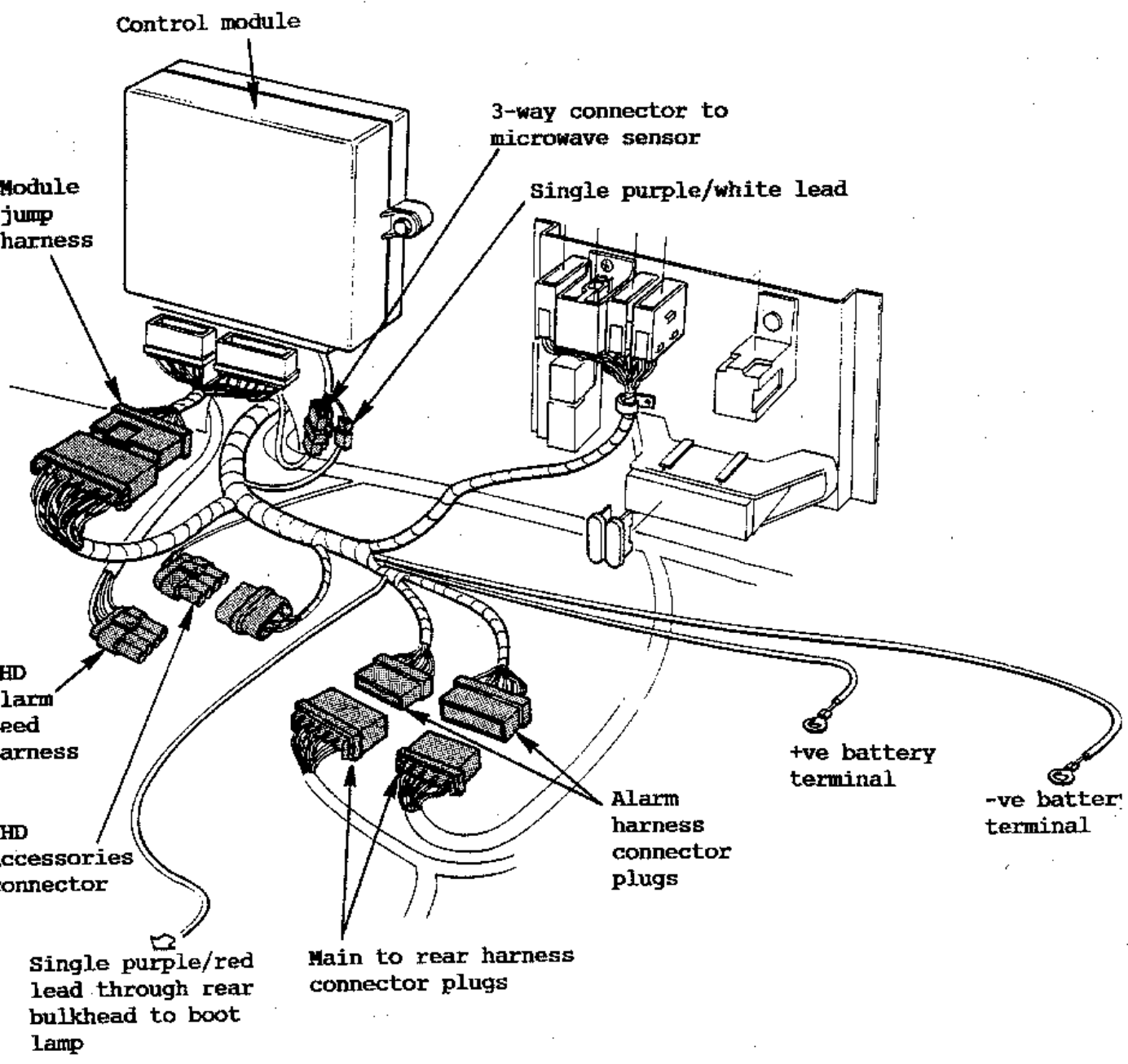


Feed the module aerial lead beneath the map pocket and alongside the main harness (use the harness taping to secure) towards the gear lever, doubling back if necessary. Do NOT earth, as this is the aerial for the transmitter key.

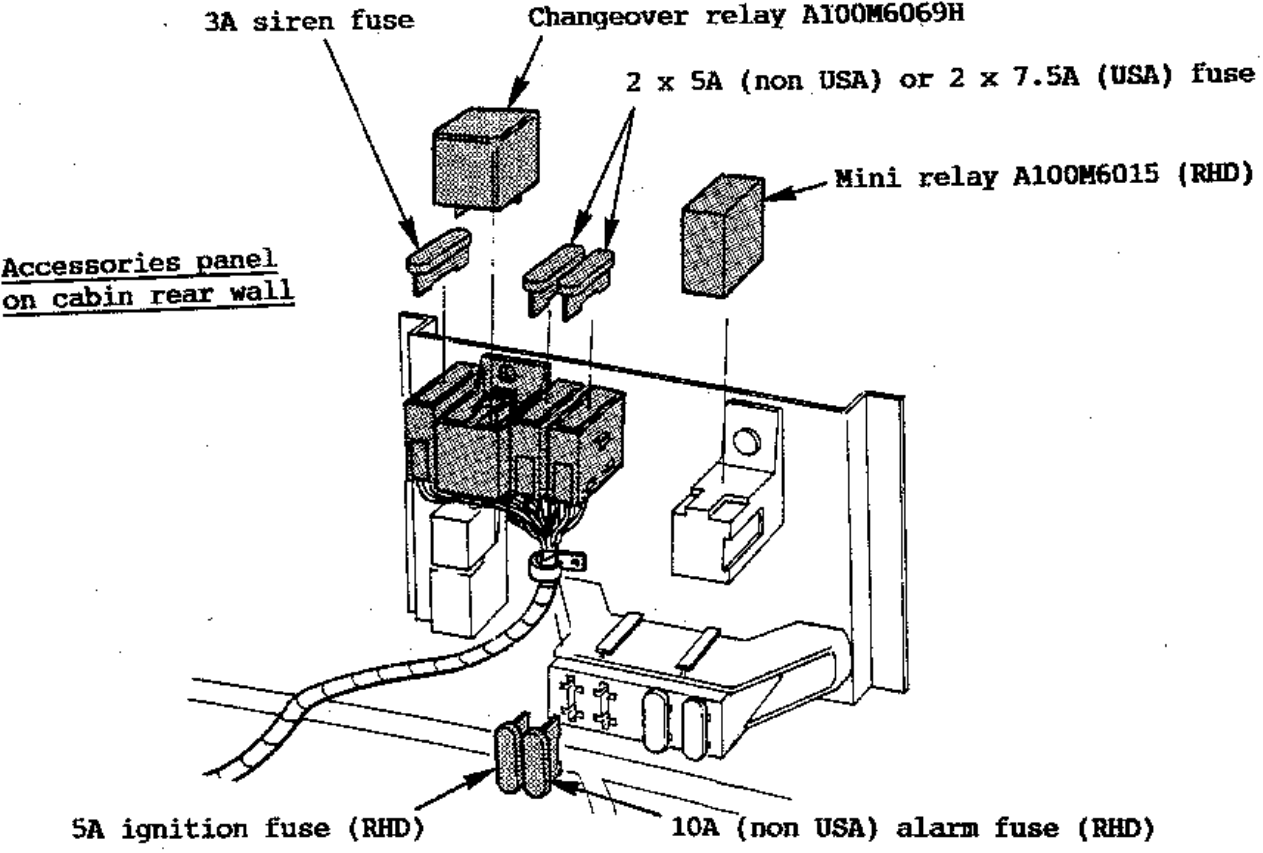
11. Plug the main multi-pin connector block of the control module jump harness into the alarm harness, the three way module connector to the microwave sensor lead, and the single module lead to the purple/white single spade connector on the alarm harness.

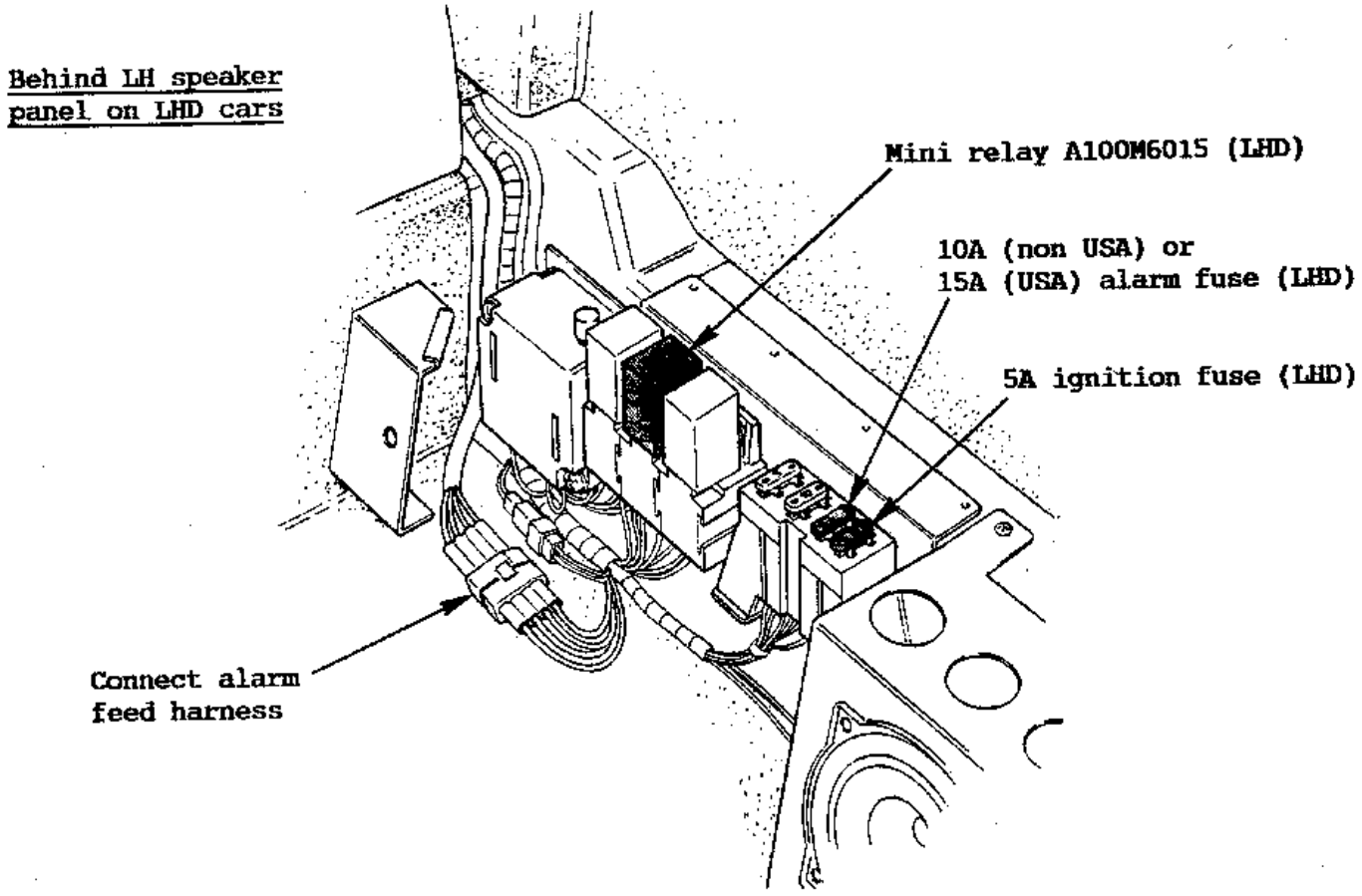
12. On RHD cars, plug the alarm harness 4-way connector into the accessories (cellular 'phone) connector. On LHD cars, plug in the alarm feed harness and route beneath the map pocket to connect with the accessories connector adjacent to the inertia switch.

13. Separate the main to rear harness connector plug, and fit both halves to the corresponding connectors on the alarm harness.
Feed the alarm harness single purple/red lead with 'piggy back' connector through the rear bulkhead grommet, and fit to the boot lamp with the lamp pink/red lead fitted to the piggy back terminal.


Control module
3-way connector to microwave sensor
Single purple/white lead
Module jump harness
HD larm eed arness
HD ccessories onnector
+ve battery terminal
-ve batter terminal
Alarm harness connector plugs
Single purple/red lead through rear bulkhead to boot lamp
Main to rear harness connector plugs

14. Fit the relay base and three fuse holders to the accessories panel on the back of the cabin rear wall using a single screw and the existing hole. If this panel is not fitted on an early LHD car, secure the relay base using a pop rivet.
    - Fit changeover relay A100M6069H into the new relay base.
    - Fit a 3A siren fuse into the new fuse holder with brown and purple leads.
    - Fit 2 x 5A (non USA) or 2 x 7.5A (USA) alarm indicator fuses into the other two new fuseholders, with green/white & pink/white, and green/red & pink/red leads.
    - Into the existing vacant fuseholders on the accessories panel (on back of cabin rear wall on RHD cars, and next to the left hand rear speaker on LHD) fit a 5A ignition fuse into the end cavity, and a 10A (non USA) or 15A (USA) alarm fuse into the remaining cavity.
    - Fit a mini relay A100M6015 into the existing relay base on the accessories panel (next to the fuel pump relay on LHD cars).


3A siren fuse
Changeover relay A100M6069H
2 x 5A (non USA) or 2 x 7.5A (USA) fuse
Mini relay A100M6015 (RHD)
Accessories panel on cabin rear wall
5A ignition fuse (RHD)
10A (non USA) alarm fuse (RHD)


Behind LH speaker panel on LHD cars
Mini relay A100M6015 (LHD)
10A (non USA) or 15A (USA) alarm fuse (LHD)
5A ignition fuse (LHD)
Connect alarm feed harness

15. Fit the siren and master switch: If the RH rear speaker trim panel is already fettled for the siren grille, key switch and siren bracket, cut the remaining bridges and remove the infill panel. Use a sharp knife to cut the carpet around each of the apertures.
    If the panel is not fettled, use the template provided to mark out the grille aperture, keyswitch hole, and siren bracket fixing holes before cutting and drilling the panel.
    Fit the siren grille, keyswitch and siren using the fixings provided (gold passivated screws with gold carpet, black screws with others).
    Fit the two terminated cables on the keyswitch (either way round) into the keyswitch connector block. Connect the keyswitch and siren to the alarm harness and refit the trim panel.

16. Connect the LED tell tale lamp as the tunnel trim is refitted. Fit the new tunnel tray mat. Refit the roof stowage compartment floor.

17. Check that the master keyswitch is turned off (clockwise) before connecting the +ve and -ve alarm harness leads to the battery leads, and re-connecting the battery. When the master switch is turned on (counterclockwise), the system will automatically be armed, so have the transmitter key handy to disarm the system during the arming delay period, until ready for testing.

TESTING THE SYSTEM

Refer to the operating instructions listed earlier to check that the system performs as specified. Check the central locking function, and that the alarm is activated (after the arming delay period) by opening either door, boot lid, switching on the ignition, or movement within the cabin.

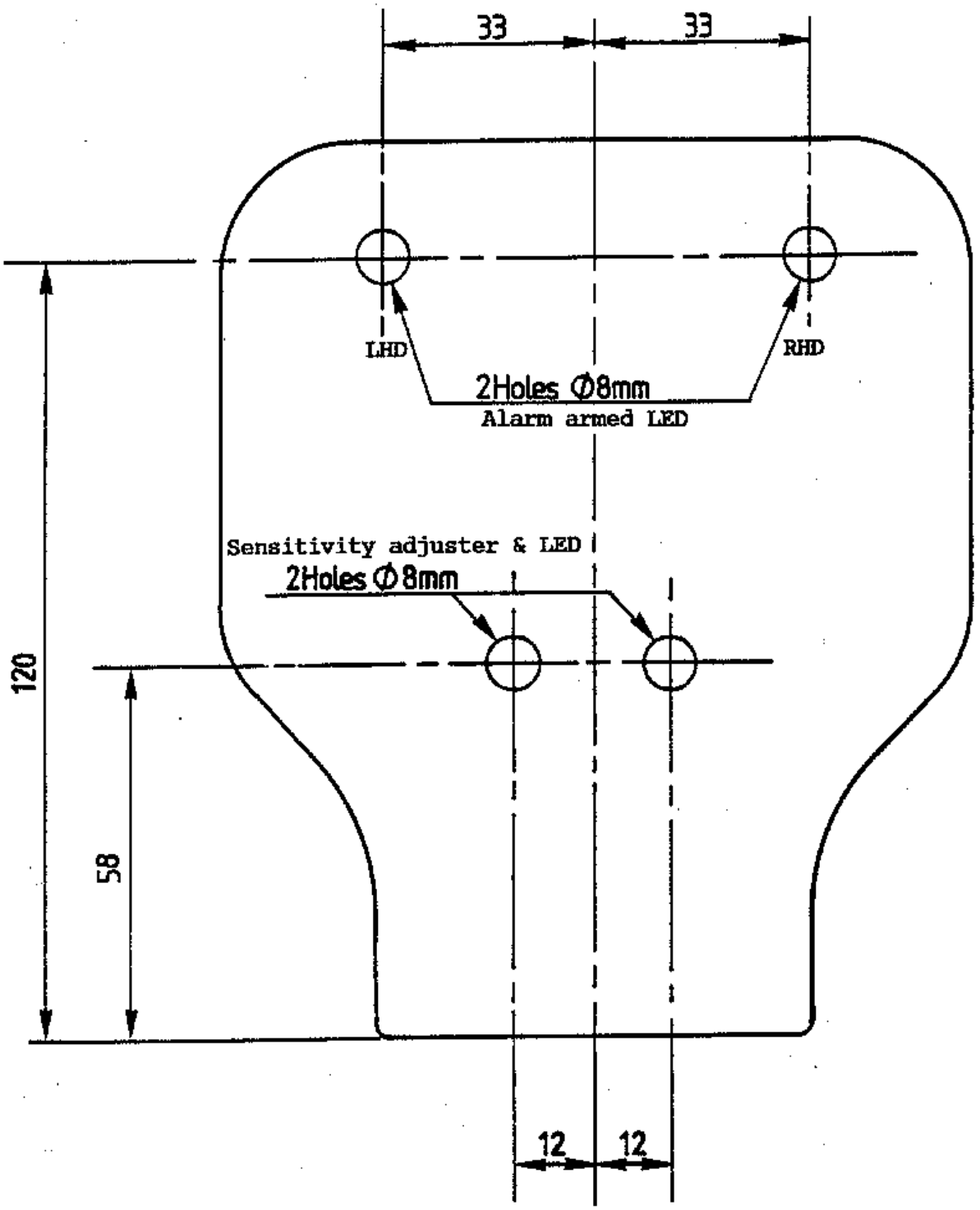
Adjustment of Microwave Sensor

The sensitivity (range) of the microwave sensor can be adjusted during the 40 second arming delay period:

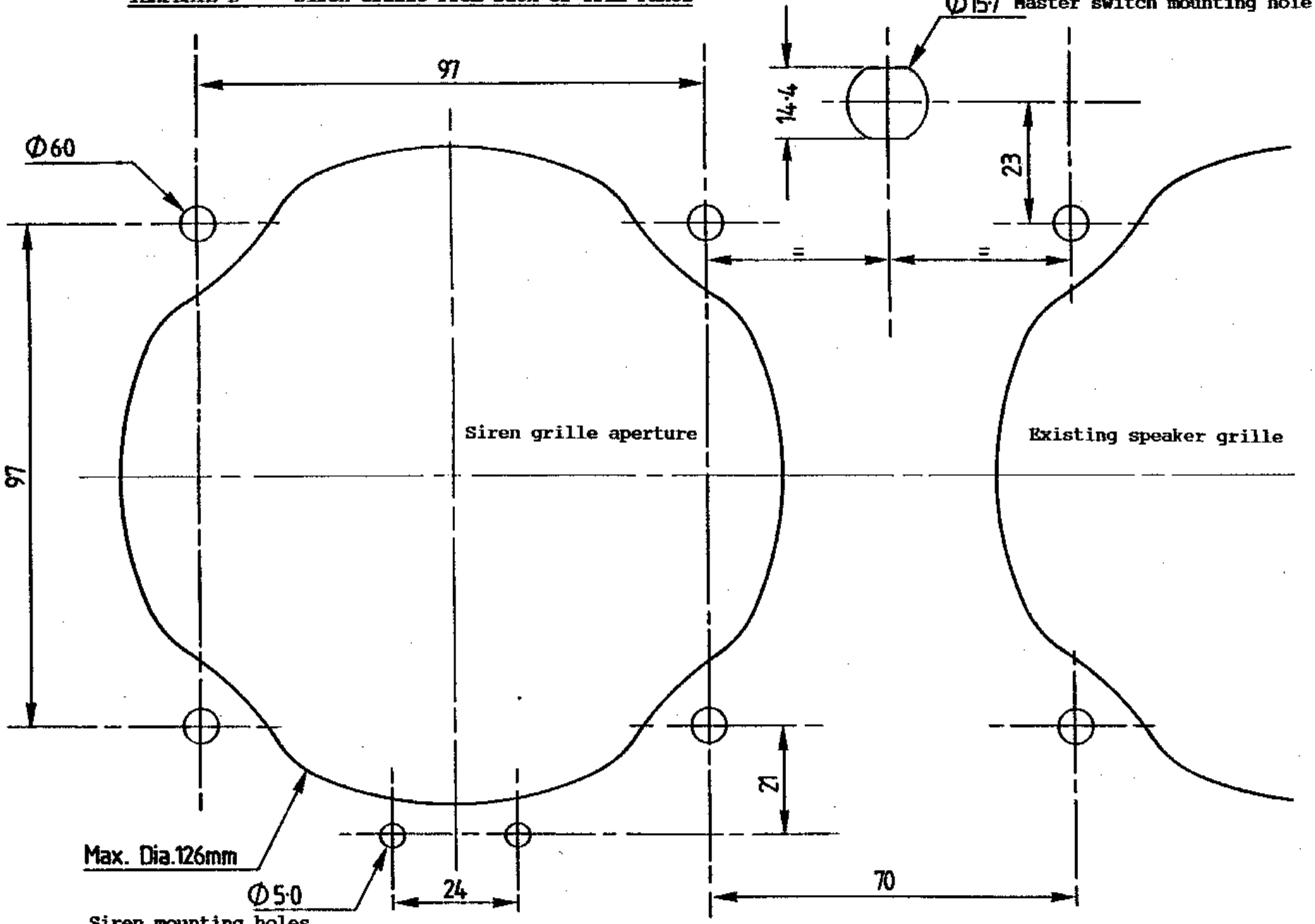
Remove the tunnel tray mat, observe the pilot light, and arm the system. After a 10 second stabilisation period, wave an arm at a progressively decreasing distance from the microwave sensor, until the pilot light flashes and indicates that the movement has been detected (alarm triggered). Check that movement outside the vehicle does not trigger the alarm. Adjust if necessary by turning the sensor screw clockwise to increase sensitivity (range) or counterclockwise to decrease sensitivity. Refit the tunnel tray mat.

Complete both parts of the alarm system Registration Card, return one part to Lotus Cars Warranty Department, and insert the other in the back of the Owner's Handbook. Ensure that the owner is supplied with the alarm system handbook supplement.

TEMPLATE A - Centre Tunnel Recess



TEMPLATE B - Siren Grille From Back of Trim Panel



The Elan S2 models differ from 'S1' versions in the following respects:

- Gemini Aquila 5160T Lotus tailored vehicle security alarm (S1 - Gemini 1059 microwave).
- Tungstone Heavy Duty Type 027 battery, with SAE rating of 550 amps (S1 - Exide 420 amp).
- Positive battery cable routed alongside chassis backbone for improved suppression (S1- inside cabin).
- New type safety inertia switch in LH speaker enclosure on all models (S1 RHD in battery compartment.
- Lights-on buzzer replaces interior lamp delay module in relay station.

VEHICLE SECURITY ALARM

The Lotus tailored Gemini Aquila 5160T is designed to meet Thatcham 'Category 1' and BS 6803 requirements. The alarm system enhances theft protection of the car and contents as well as providing remote control of the central locking by a hand held transmitter key. When the alarm is triggered, a high pitched siren is sounded, and in some markets, the hazard lamps flashed for a period of thirty seconds, before the alarm switches off and automatically resets. (Note that variations may occur due to the legal requirements of individual countries.)

The alarm system monitors the following parameters and may be triggered by:

- opening either door;
- opening the boot;
- energising the ignition or starter circuits;
- removing the audio set;
- tampering with or disconnecting the alarm circuits or siren;
- disconnecting the vehicle battery;
- violent intrusion into the passenger compartment (selectable feature).

Additional features of the the alarm system include: 'passive immobilisation' (see later); the option of switching off the ultrasonic intrusion sensing; an LED tell tale for intruder deterrence and to signal alarm status and triggering source; a personal protection facility; and a long term power saving feature.

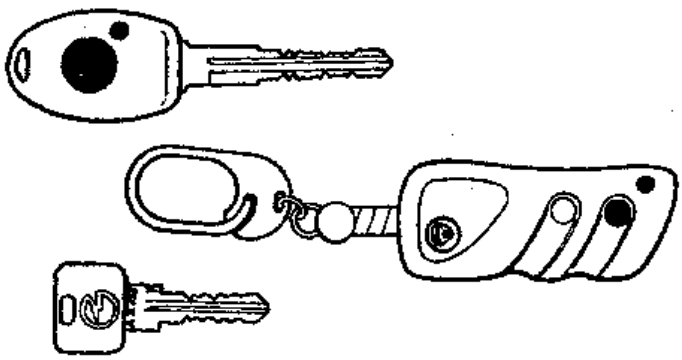
Alarm Keys

In addition to the two manual keys supplied with the vehicle, the following alarm system keys are also provided:

One alarm/ignition key;

One alarm transmitter;

Two siren keys;



oh20

Supplied with the alarm keys is a plastic card which identifies the Personal Security Code for the transmitter frequency. The key number stamped on the shank of the siren keys should be noted on the card, and the card kept by the owner safely offboard with the vehicle documents together with the spare siren key for use in an emergency. When ordering a replacement transmitter key, the Personal Security Code and if applicable, the manual key number must be quoted.

Arming the Alarm

To arm the alarm system, first raise the soft top roof, close the boot lid and both doors, then press the single button on the alarm/ignition key, or the grey button on the transmitter key. This will switch on the alarm, immobilise the engine and operate the central door locking to lock both doors. Activation is

acknowledged by a single flash of the hazard lamps.

If it is desired to arm the alarm without intrusion sensing (ultrasonics), for example if leaving an animal in the car, use the transmitter key and press the red button twice within any 3 second period. This command will switch on the alarm (less intrusion sensing), immobilise the engine, operate the central door locking, and be acknowledged by two flashes of the hazard lamps.

Further indication of alarm activation is provided by an LED tell tale in the tunnel trim behind the parking brake lever. This tell tale will change from a rapid pulsing (unarmed) to a one second flash interval after the alarm is armed.

After the arming command is made, a short delay will occur before the various sensors become operative, after which time the alarm will be triggered by the opening of a door or bootlid, energising of the ignition or starter circuits, removal of the audio set, tampering with the alarm circuits, disconnection of the battery, or violent intrusion to the passenger compartment. When triggered, the alarm siren will sound for 30 seconds, accompanied in some markets, by the flashing of the hazard lamps. After 30 seconds, the alarm will switch off and automatically reset. If the triggering signal is still present (e.g. a door is left open), the alarm will again sound after a 15 second pause, and this cycle will be repeated a number of times as indicated in the following table. After the specified number of cycles, the particular sensor is then isolated, but the alarm remains armed and will be triggered by any of the remaining sensors. This feature complies with European legislation on noise pollution.

Triggering sensor	Arming delay	No. of alarm cycles
Door switches	40 secs.	3
Boot switch	40 secs.	3
Ignition circuit	5 secs.	unlimited
Starter circuit	18 secs.	unlimited
Intrusion (ultrasonic)	40 secs.	6
Audio set	5 secs.	5
Battery disconnection	5 secs.	unlimited

Disarming the Alarm

To switch off the alarm and operate the central door locking to unlock both doors; press again the button on the alarm/ignition key, or the grey button on the transmitter key. Disarming is normally acknowledged by three flashes of the hazard lamps. In addition, the interior lamp will illuminate for 6 seconds and the tell tale on the centre tunnel will change from a one second pulse to a continuous light for 18 seconds followed by very rapid pulsing.

If, however, the alarm had been triggered during the last armed period, the disarming signal will be acknowledged by five flashes of the hazard lamps, whilst the LED tell tale will light continuously for 18 seconds followed by a flash code to indicate which of the sensors had caused the triggering:

LED Flashes		Triggering Sensor
* * * * * * pause * * * * * *	(6)	Audio set
* * * * * pause * * * * *	(5)	Ignition circuit
* * * * pause * * * *	(4)	Door switch
* * * pause * * *	(3)	Boot switch
* pause *	(1)	Intrusion sensors

Note that the LED tell tale is normally lit at all times, indicating either alarm disarmed status by a very rapid pulsing, or an alarm armed status by a one second pulsing. However, a power saving feature of the system results in the LED being switched off 48 hours after the last arm or disarm command.

Passive Immobilisation

This feature is designed to ensure optimum vehicle security without requiring positive action by the driver, and is a requirement of some motor insurance policies. The alarm system allows only a certain period of time for the engine to be started after:

i) disarming the alarm, or;

ii) switching off the ignition.

- and if the ignition is not switched on within 18 seconds, the engine cranking and ignition circuits are disabled automatically (passive immobilisation). The engine cannot then be started until, with the ignition

switched off, the alarm has been switched on and then off again. The button in the alarm/ignition key may be used for this purpose, with a brief pause before the second press. The driver should be aware of this feature when driving in heavy traffic or queues, where the engine may be switched off for short periods - after stopping the engine, the ignition should be switched on again in order to keep the starter circuit active.

Personal Protection

When the alarm is armed, the siren can be activated by pressing the red button on the transmitter key. This feature may be used to ward off unwelcome attention to car or person. Pressing the red button a second time will switch off the siren. Operation of the siren in this way does not affect the status of the theft alarm which will remain armed.

Siren Deactivation

The siren is located behind the trim panel at the right hand side of the roof stowage area, and can, if necessary, be switched off using the siren key: Lift the carpet at the right hand end of the roof stowage compartment, and insert the siren key into the keyswitch accessible via a hole in the trim panel. Turn counterclockwise to deactivate.

The self powered siren uses its own battery which is recharged by the vehicle alternator.

Transmitter Battery

The operating range of the transmitter keys will vary from over 25 metres to a lesser distance depending on the state of the transmitter batteries. When replacement of the batteries in the alarm/ ignition or transmitter key is due (within final 50 operations of expected life), the alarm siren will emit a short audible tone during transmitter operation. In addition, the LED on the transmitter key will light for only one second.

To replace the batteries in the alarm/ignition key, remove the two screws, and prise apart the two halves of the key head. Fit a pair of replacement batteries into the clip, with the negative side towards the printed circuit board, and reassemble the key.

Battery specification: Lithium 3V, Toshiba CR 1616; Lotus part no. A100M6221F.

To replace the batteries in the alarm transmitter: remove the single screw and separate the two halves of the transmitter body. Fit a pair of replacement batteries into the clip, with the negative side towards the printed circuit board, and reassemble the body.

Battery specification: Lithium 3V, Toshiba CR 2016; Lotus part no. A100M6219F.

Adjustment of the Ultrasonics

The primary function of the ultrasonics feature is to detect a forced break-in (e.g. window breakage). The sensitivity of the ultrasonics increases significantly with ambient temperature, and in order to minimise the potential for false triggering, the factory setting of the sensitivity should not normally be disturbed. Reliable testing of the ultrasonic system sensitivity is not easily achieved, but the alarm should be triggered (after the 40 second arming delay) by the movement of a seated occupant leaning forward.

If necessary, the sensitivity of the intrusion sensing feature can be adjusted; oversensitivity may result in false triggering of the alarm by passers-by, or wind gusts. An adjuster screw is fitted on the alarm controller and may be accessed as follows:

RHD cars: The controller is mounted on the back of the relay station mounting bracket above the driver's footwell, with the adjuster screw on the upper surface. Access is available after removing the instrument binnacle cover, and using a long shafted screwdriver just outboard of the steering column support bracket.

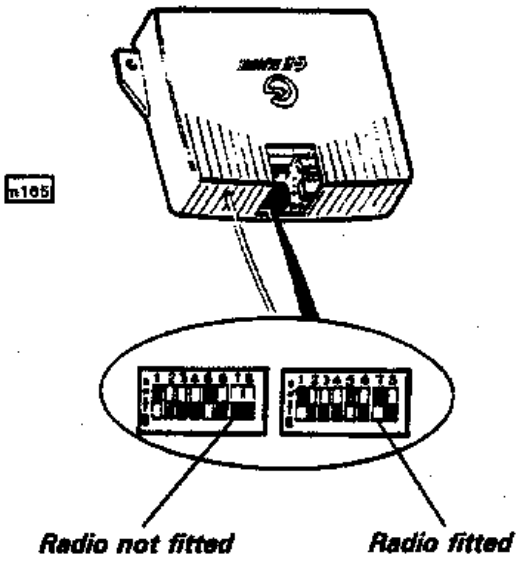
LHD cars: The controller is mounted on the passenger door hinge post, behind the fascia, with the adjuster screw on the lower surface. Access is available from the passenger footwell.

When adjusting the ultrasonic sensitivity or testing trigger functions, turn off the siren (using the siren key), and use the hazard lamps as an indication of alarm triggering. Remember to turn back on the siren when tests are complete.

Audio Set Alarm Sensing

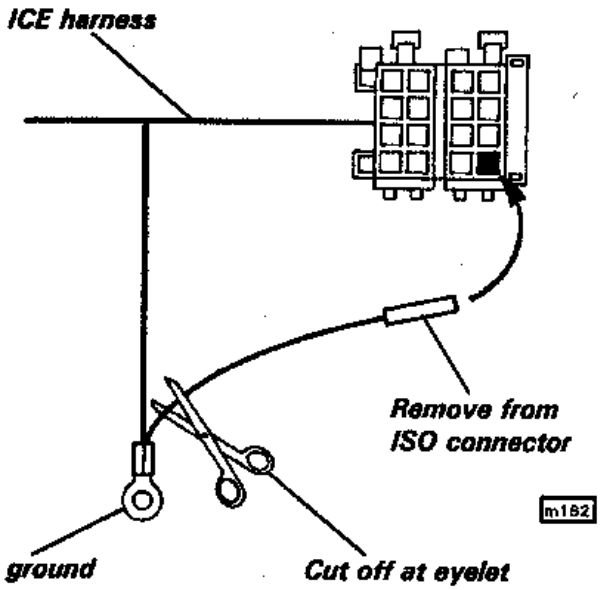
The alarm controller uses an earth lead to sense the presence of an audio set, with the lead connected to the body of the set. If an audio set is to be fitted to a car factory built without one, the following action must be taken to ensure that the set is protected by the alarm.

RHD cars: The radio alarm link is already fitted and earthed to the scuttle beam at the right hand end of the row of mini-relays, accessible beneath the binnacle cover. Release the lead and attach to the case of the audio set. Note that the alarm controller radio option switch is already set to the 'on' position.



LHD cars (from VIN R 6165): On these cars, the radio harness eyelet is earthed (with no radio) via a bridging cable to an earth terminal in the radio harness ISO connector plug. When fitting a radio, unplug the bridging cable and cut off from the eyelet. Attach the eyelet to the radio case. Note that the alarm controller radio option switch is already set to the 'on' position.

LHD cars (prior VIN R 6165): Obtain radio alarm link A082M4989F and plug into the brown/black lead from the I.C.E. harness. Attach the lead to the case of the audio set. The alarm controller must then be reprogrammed: Drop the glovebox down for access to the controller, and unclip the small cover on the top of the controller case. Move switch no.7 to the down ('on') position, and refit the cover.



Alarm Notes:

- If the vehicle battery becomes discharged to the extent that the engine cannot be cranked, it is possible that the voltage drop during start attempts may be registered by the alarm system as a battery disconnection, and result in automatic arming and subsequent triggering of the alarm.
- In the event of the vehicle battery becoming completely drained (e.g. lights left on), it is possible that insufficient power will remain for the alarm to be switched off on command. In this case, the doors should be unlocked manually, and the self powered siren, which will be triggered when a door is opened, turned off using the siren key. As soon as auxiliary power is provided (e.g. by 'jumper leads'), the alarm may be disarmed.

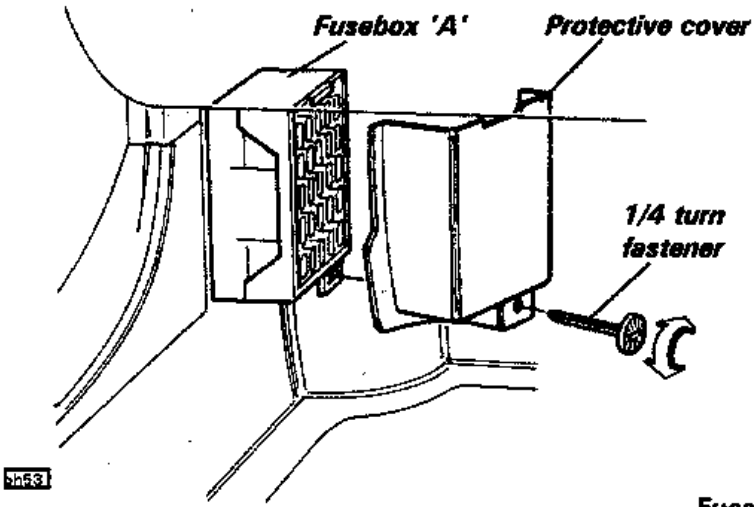
Central Door Locking

Central door locking is an integral part of the transmitter operated vehicle alarm system as described above, but note that CDL does not operate if the door locks are operated manually via the keys or interior buttons. Consequently, the anti-lockout feature of the S1 model is not applicable, so care should be taken not to lock the keys inside the vehicle by button locking a door before closing.

On any Elan S2 cars not fitted with a vehicle alarm system, central door locking is as for the S1.

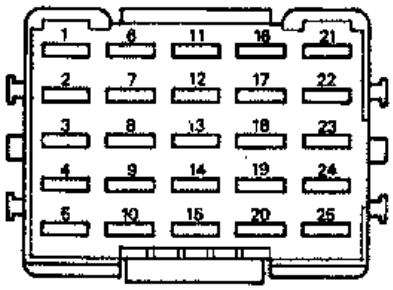
FUSE & RELAY LOCATION

Main Fusebox 'A' - ahead of passenger door hingepost



n531

Slot numbering

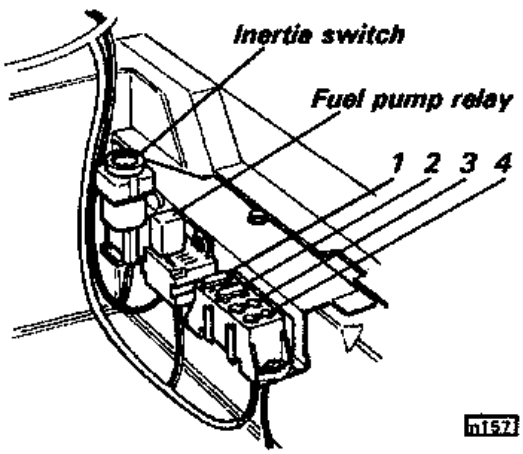


n154

Fuse	Rating	Circuit
A 1	15A	Horns
A 2	7.5A	Air conditioning
A 3	7.5A	Fuel pump
A 4	RHD 10A	Lighting
	LHD 7.5A	Alarm/CDL
A 5	10A	Engine ECM
A 6	5A	Side lamps LH
A 7	5A	Side lamps RH
A 8	RHD 5A	Alarm power
	LHD 3A	Radio key-in
A 9	15A	Alarm power
A 10	3A	Eng.man. VSV
A 11	10A	Hazard lamps

Fuse	Rating	Circuit
A 12	3A	Battery
A 13	5A	Stop lamps
A 14	5A	Interior lamps
A 15	15A	Rear fog lamps
A 16	10A	D/I. & reverse lamps
A 17	20A	Wash/wipe
A 18	7.5A	Ignition services 1
A 19	3A	Door mirror heaters
A 20	3A	Ignition relay
A 21	5A	Door mirrors
A 22	3A	Ignition services 2
A 23	20A	Interior fan
A 24	15A	Cigar lighter
A 25	LHD 5A	Alarm power

LH Speaker Enclosure



n157

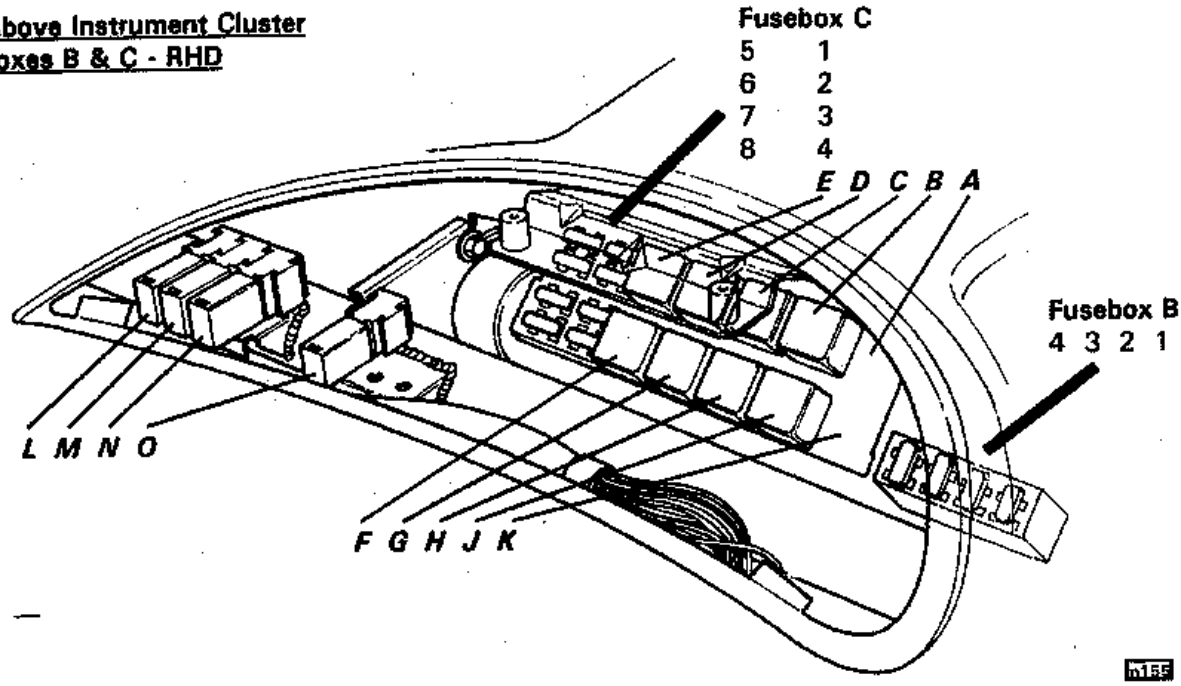
Fuses in Battery Compartment (RHD, Jap, Aus, & early U.K.)

Fuse	*Rating*	*Circuit*
1	5A	Radio
2	10A	Aerial
3	5A	Alarm siren

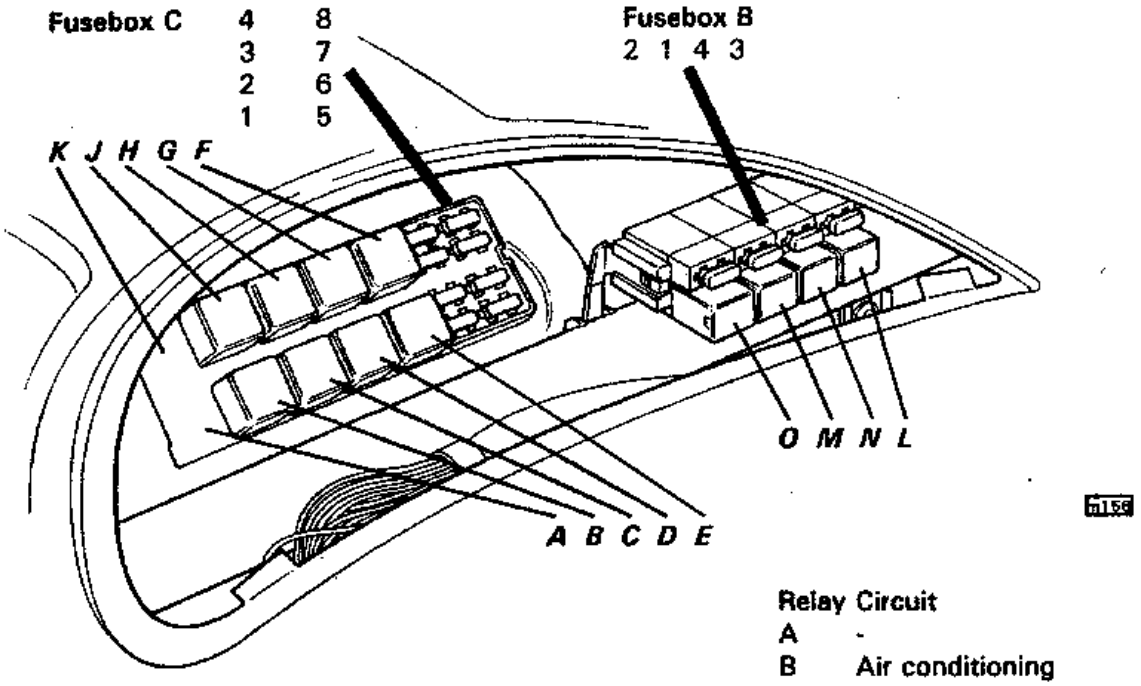
Fuses in LH Speaker Enclosure

Fuse	*Rating*	*Circuit*
1	5A	Radio
2	10A	Aerial
3	5A	LHD alarm siren
4	5A	U.K. alarm siren

Relays Above Instrument Cluster & Fuseboxes B & C - RHD



Relays Above Instrument Cluster & Fuseboxes B & C - LHD



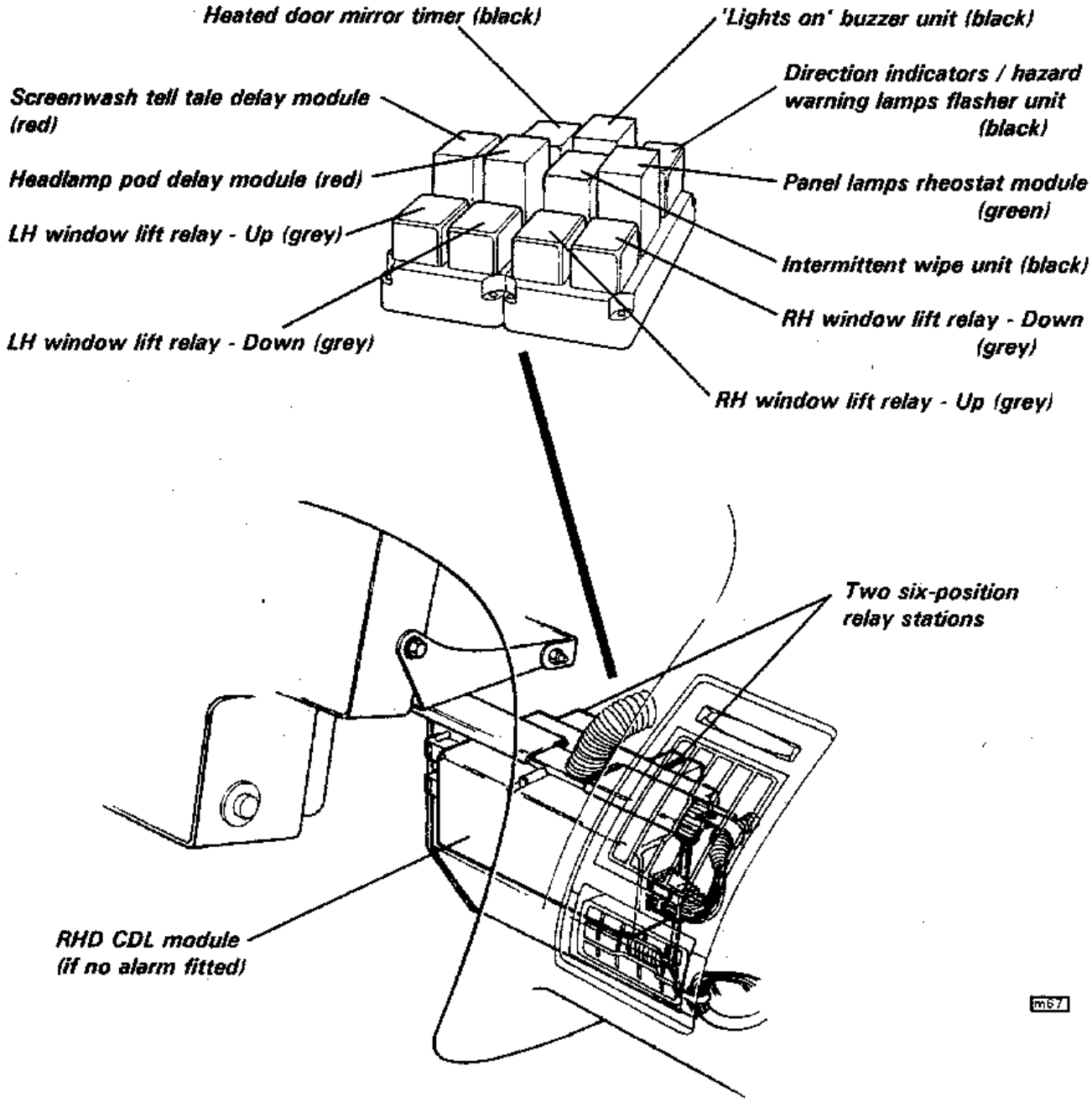
Fuse	Rate	Circuit
B 1	20A	RH window lift
B 2	20A	LH window lift
B 3	15A	RH cooling fan
B 4	15A	LH cooling fan

Fuse	Rate	Circuit
C 1	15A	LH H/L motor
C 2	15A	RH H/L motor
C 3	10A	LHD Lighting
	7.5A	RHD CDL (no alarm)
C 4	5A	Coolant pump
C 5	7.5A	LH dip beam
C 6	7.5A	RH main beam
C 7	7.5A	LH main beam
C 8	7.5A	RH main beam

Relay	Circuit
A	-
B	Air conditioning
C	Cooling fans
D	Interior fans - fast
E	Main beam
F	Dip beam
G	Elec. coolant pump
H	Ignition services
J	Start
K	-
L	Rear fog lamps
M	Engine man. ECM
N	Interior fan - slow (a.c.)
O	Horns

Relay Station Above Driver's Footwell
(RHD shown, LHD similar & opposite)

*** As viewed from beneath ***


Heated door mirror timer (black)
'Lights on' buzzer unit (black)
Direction indicators / hazard warning lamps flasher unit (black)
Screenwash tell tale delay module (red)
Headlamp pod delay module (red)
Panel lamps rheostat module (green)
LH window lift relay - Up (grey)
Intermittent wipe unit (black)
RH window lift relay - Down (grey)
LH window lift relay - Down (grey)
RH window lift relay - Up (grey)
Two six-position relay stations
RHD CDL module (if no alarm fitted)
m67

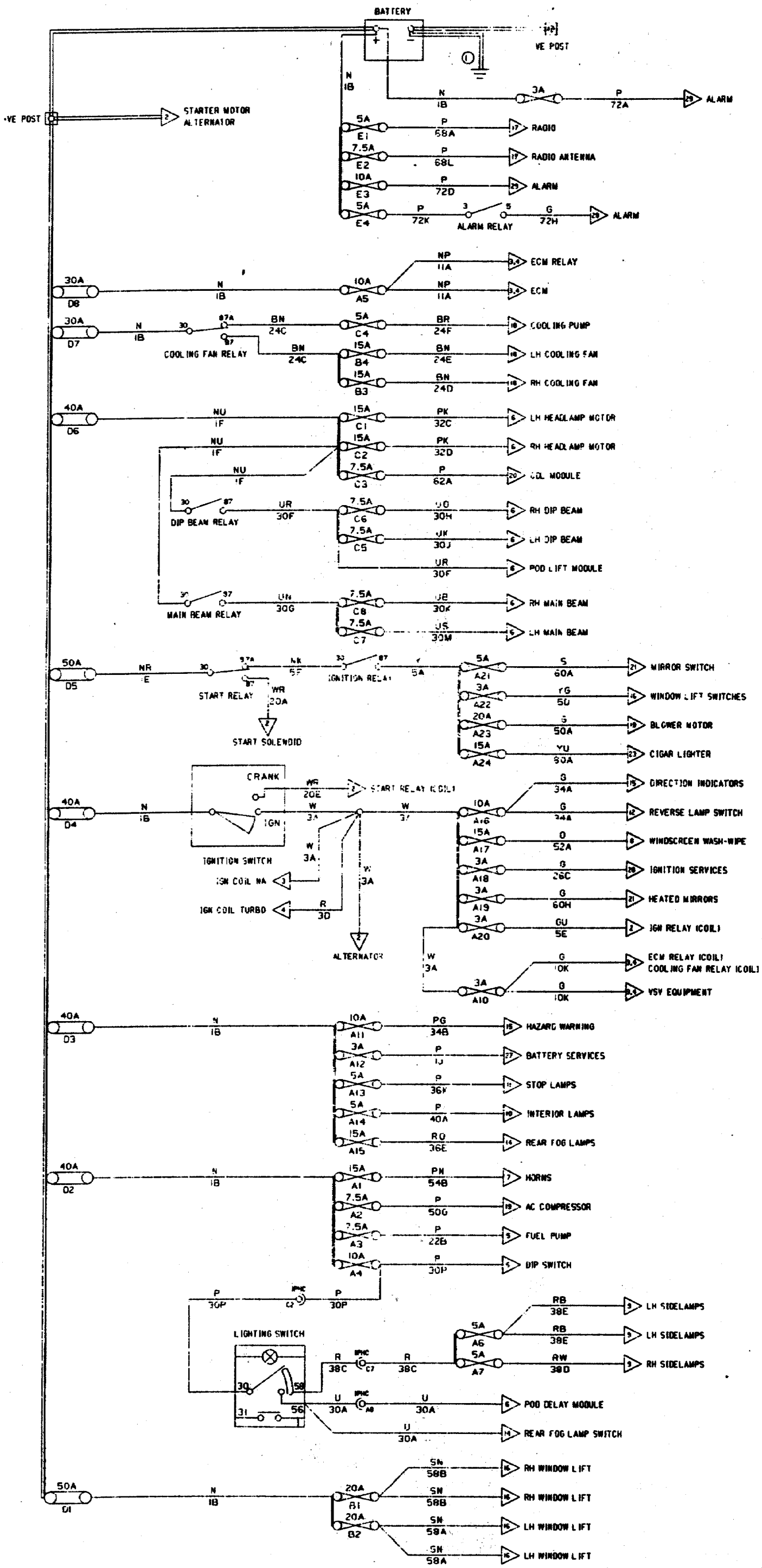
MJ.25 - CIRCUIT DIAGRAMS

Three sets of circuit diagrams are provided. The set on white paper is for right hand drive (RHD) 'Series One' cars; those on beige paper for left hand drive (LHD) 'Series One' cars including USA and S.I.R.; and the set on grey paper for all Elan 'S2' models. A separate index page is included for each set.

Index - RHD 'Series One' cars

Circuit	Sheet RHD S1 (White)
Supplies	1
Start, Alternator & Ignition	2
Engine Management (N.A.)	3
Engine Management (Turbo open loop)	4
Fuel Pump	5
Headlamps & Headlamp Motors (with micro-switches)	6
Headlamps & Headlamp Motors (no micro-switches)	6A
Horns	7
Windscreen Wash-Wipe	8
Side & Tail Lamps	9
Interior Lamps	10
Stop Lamps	11
Reverse Lamps	12
Rear Fog Lamps	14
Direction Indicators & Hazard	15
Window Lift	16
In Car Entertainment	17
Cooling Fans	18
Heater & Air Conditioning	19
Central Door Locking	20
Door Mirrors	21
Rheostat & Panel Illumination	22
Clock & Cigar Lighter	23
Instruments	24
Warning Lamps	25
Diagnostics (ALDL)	26
Battery Services (Fuse A12)	27
Ignition Services (Fuse A18)	28
Alarm System	29
Rear Lamp Clusters	30
Convention	Appendix 1
Inter-Harness Connectors 1	Appendix 2
Inter-Harness Connectors 2	Appendix 3

SUPPLIES



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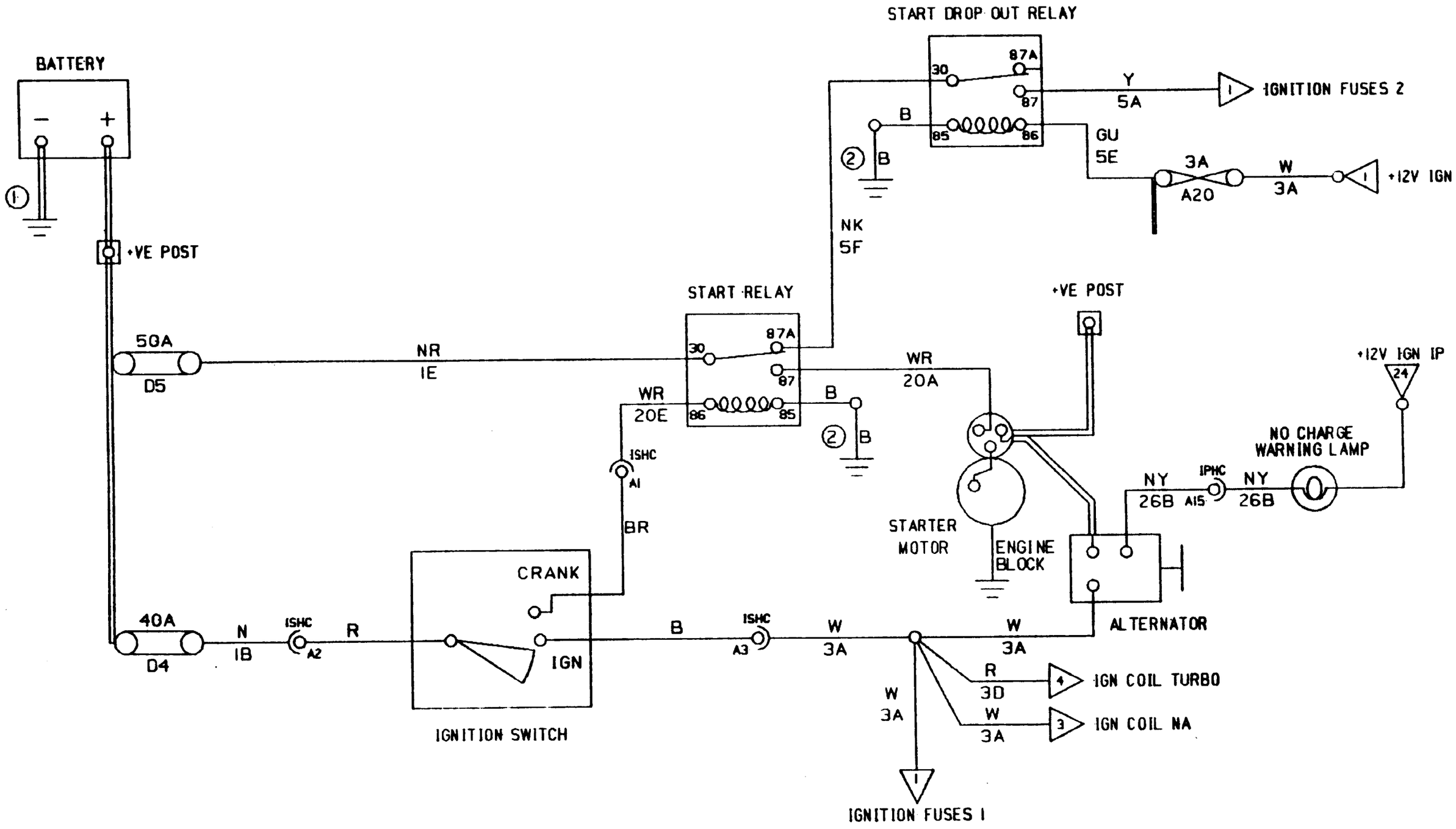
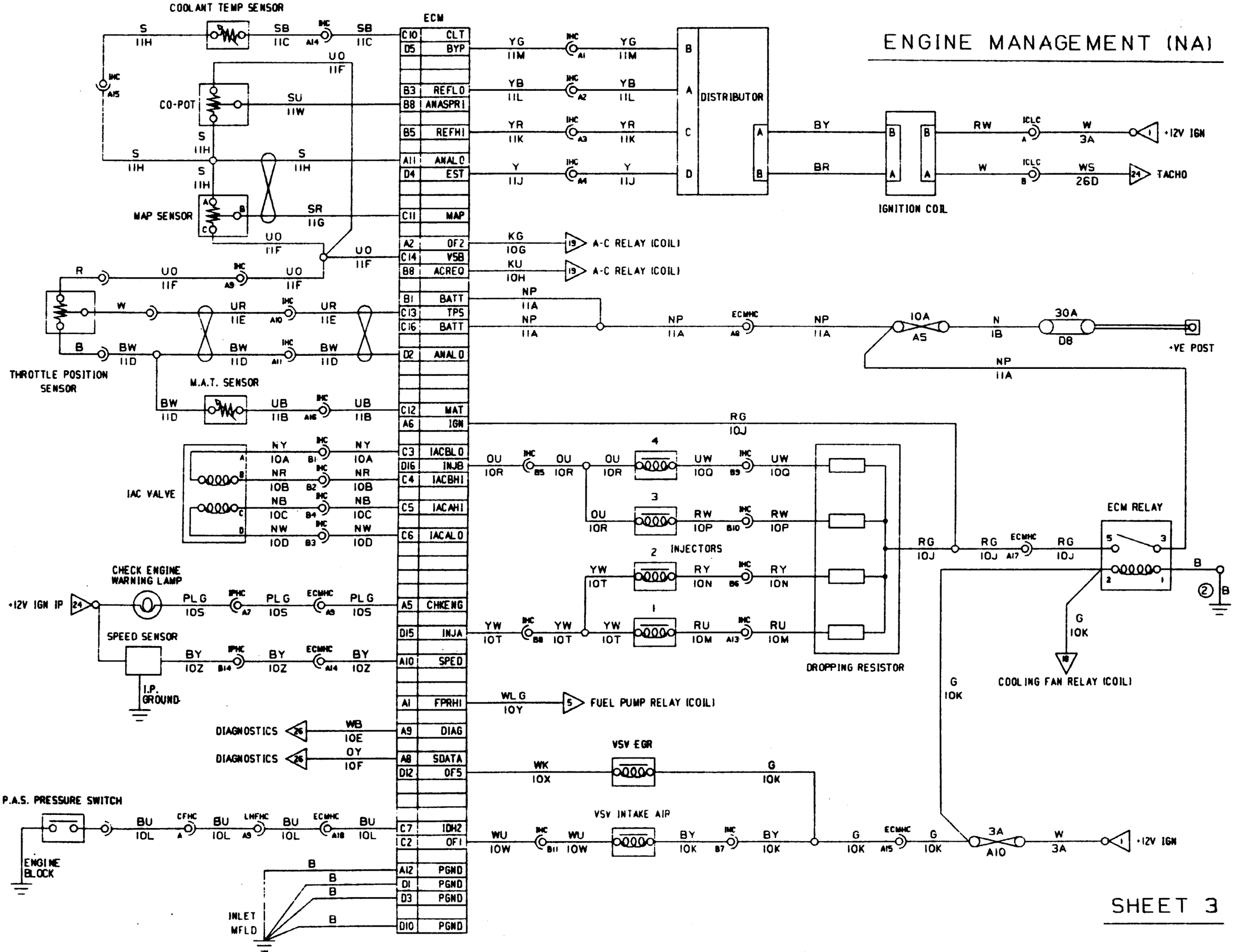
SHEET 1

START , ALTERNATOR & IGNITION

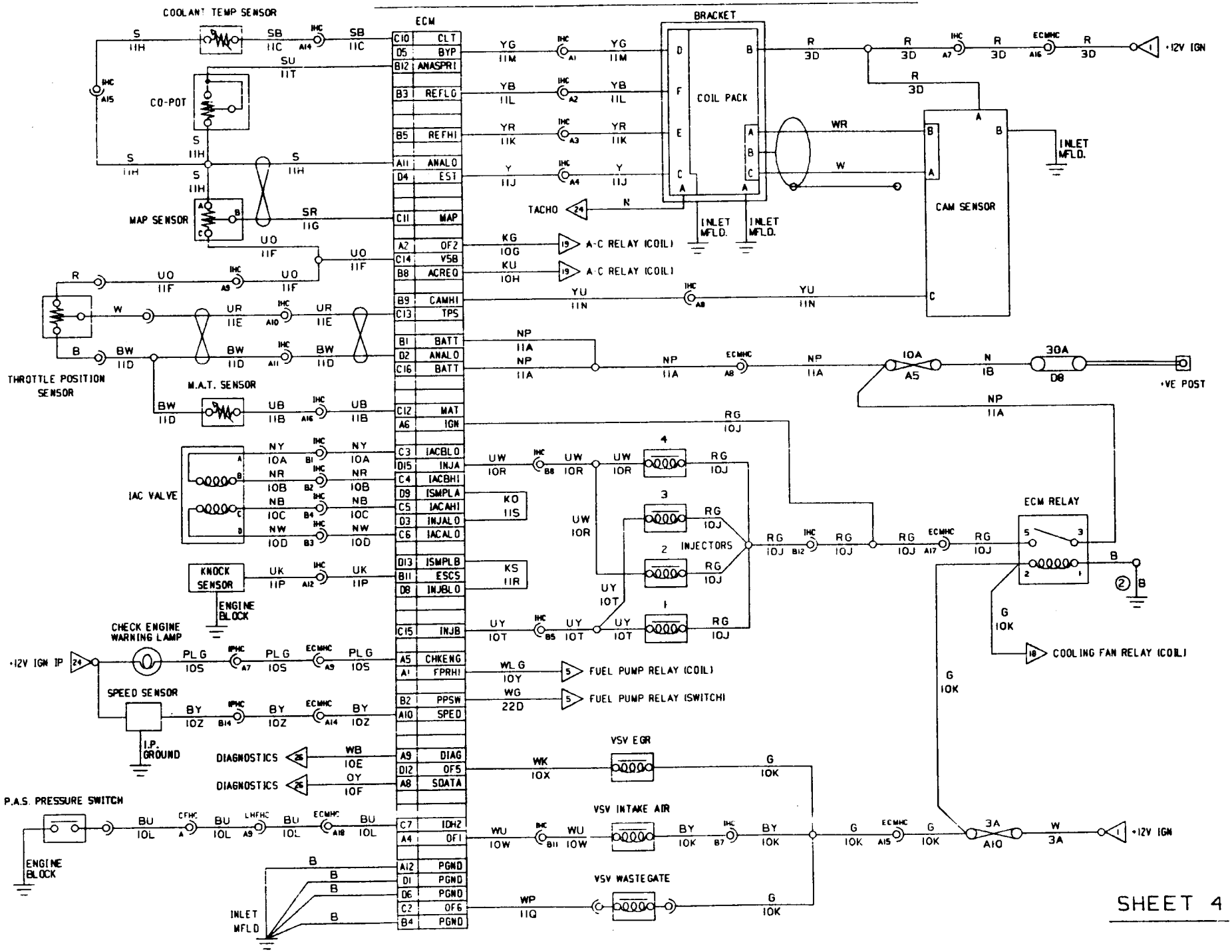


SHEET 2

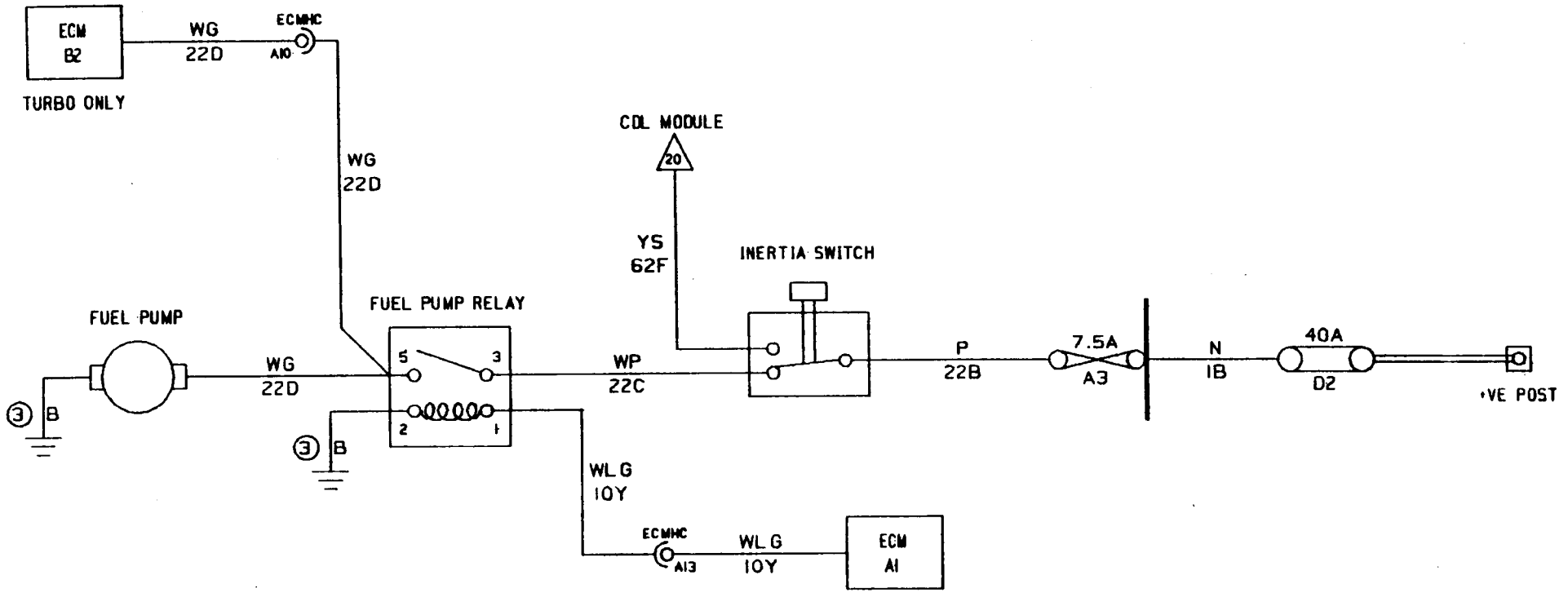
ENGINE MANAGEMENT (NA)



SHEET 3

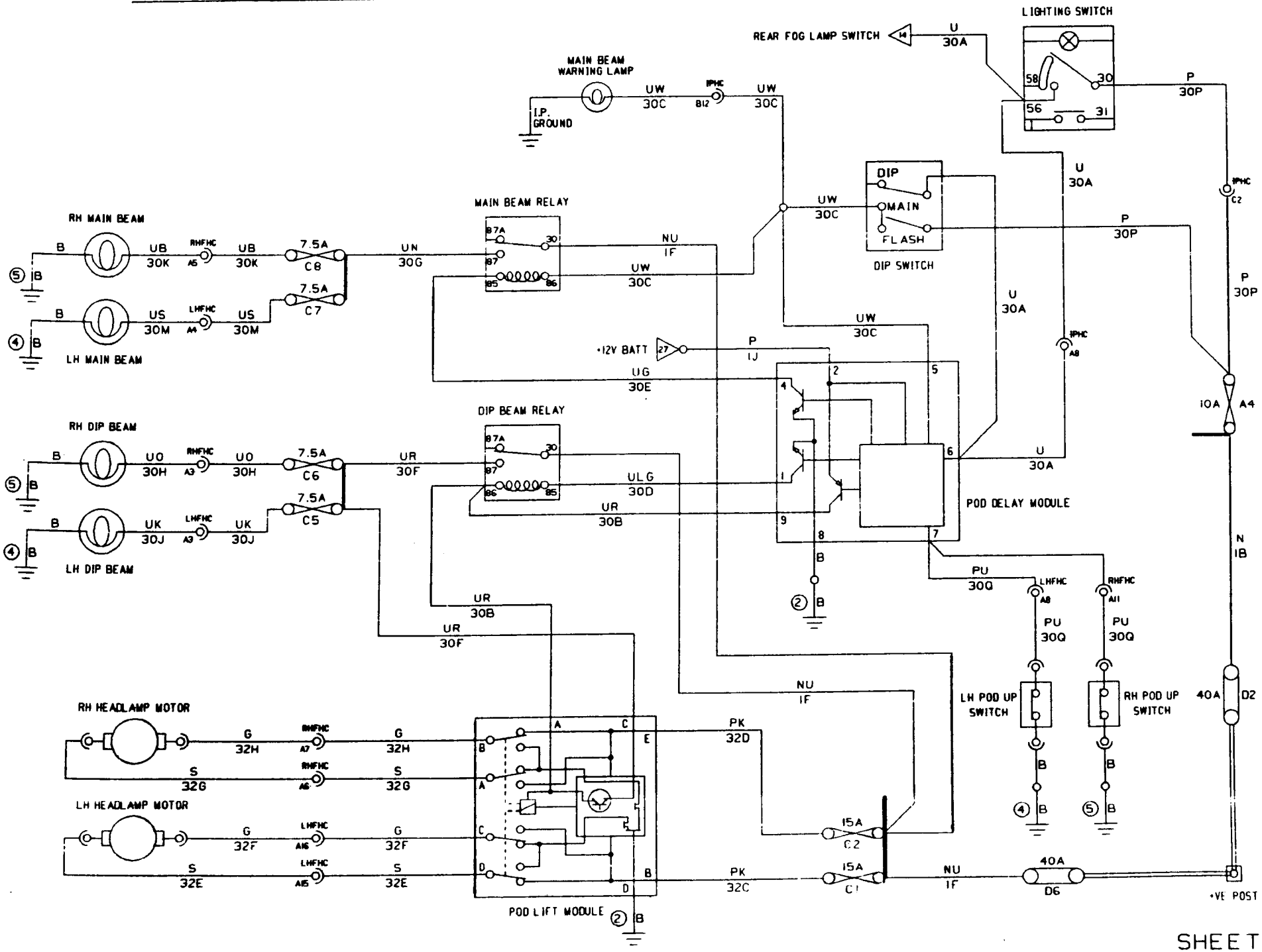

COOLANT TEMP SENSOR
ECM
BRACKET
CO-POT
COIL PACK
CAM SENSOR
MAP SENSOR
TACHO
INLET MFLD.
A-C RELAY (COIL)
THROTTLE POSITION SENSOR
M.A.T. SENSOR
IAC VALVE
KNOCK SENSOR
ENGINE BLOCK
CHECK ENGINE WARNING LAMP
+12V IGN IP
+12V IGN
SPEED SENSOR
I.P. GROUND
DIAGNOSTICS
P.A.S. PRESSURE SWITCH
INJECTORS
ECM RELAY
COOLING FAN RELAY (COIL)
FUEL PUMP RELAY (COIL)
FUEL PUMP RELAY (SWITCH)
VSV EGR
VSV INTAKE AIR
VSV WASTEGATE
+VE POST
CLT
BYP
ANASPRI
REFLO
REFHI
ANALO
EST
MAP
OF2
V5B
ACREQ
CAMHI
TPS
BATT
ANALO
BATT
MAT
IGN
IACBLO
INJA
IACBHI
ISMPLA
IACAHI
INJALO
IACALO
ISMPLB
ESCS
INJBLO
INJB
CHKENG
FPRHI
PPSW
SPED
DIAG
OF5
SDATA
IDH2
OF1
PGND
PGND
PGND
OF6
PGND
SHEET 4

FUEL PUMP



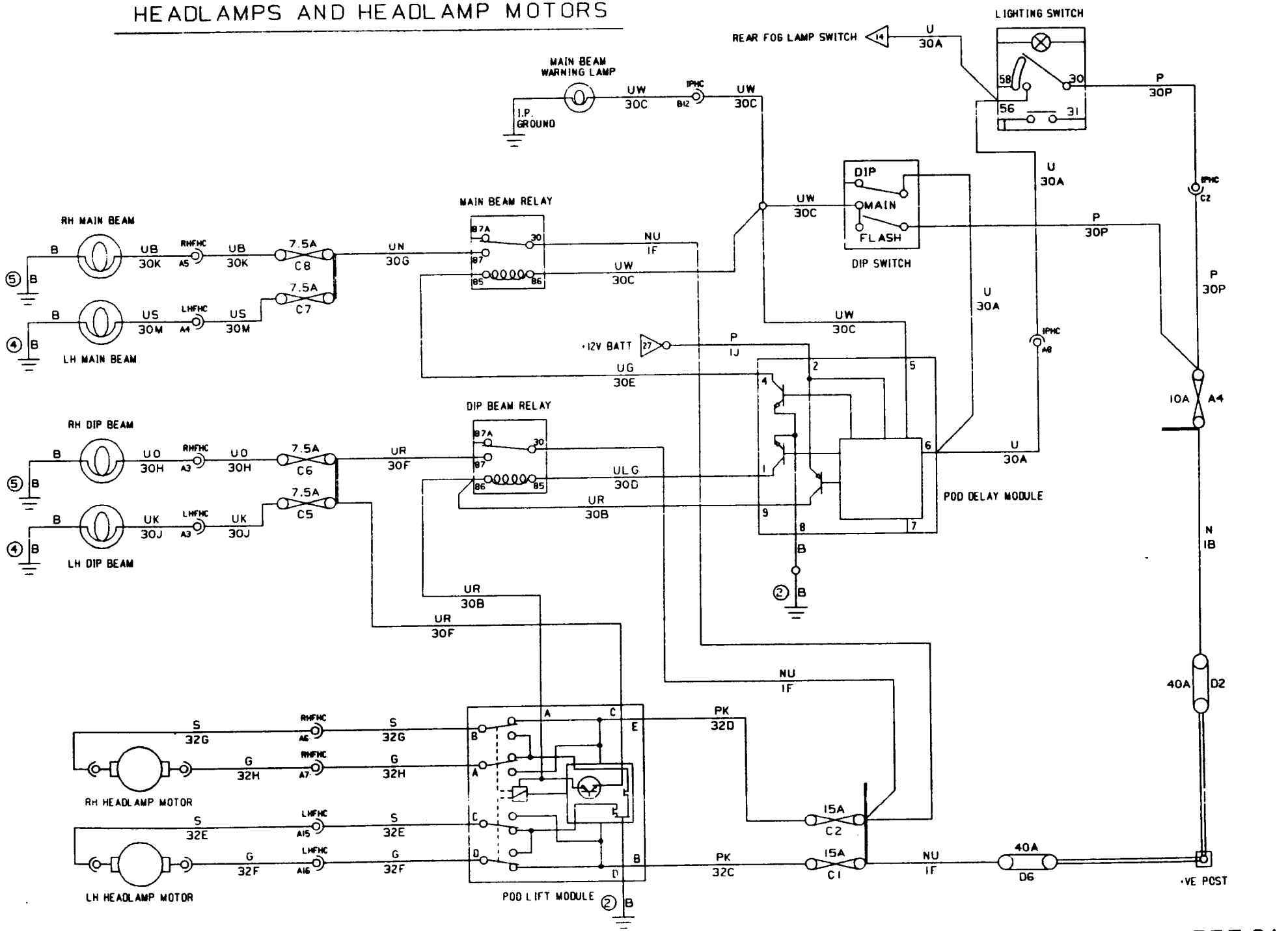
SHEET 5

HEADLAMPS AND HEADLAMP MOTORS (WITH MICRO SWITCHES)



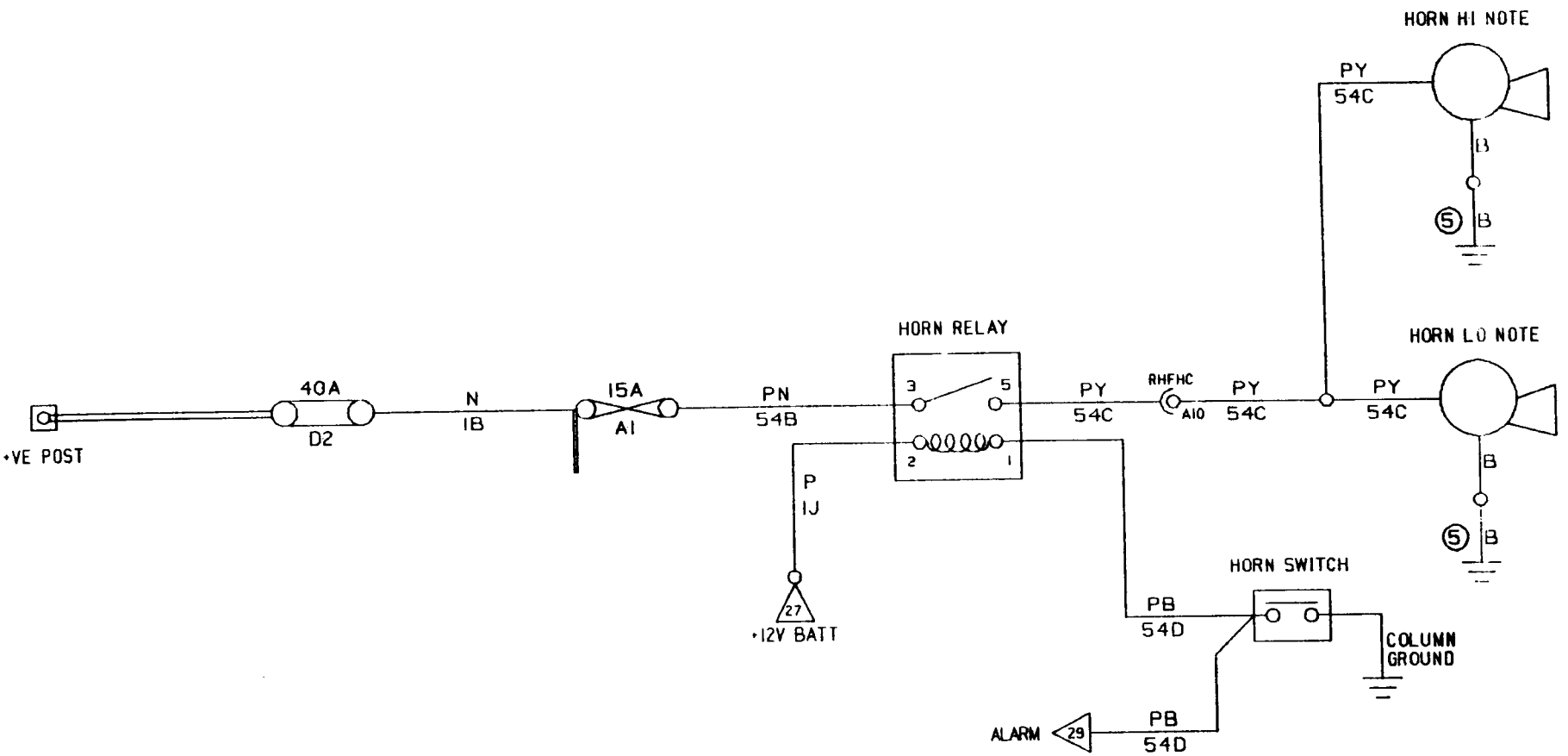
SHEET 6

HEADLAMPS AND HEADLAMP MOTORS

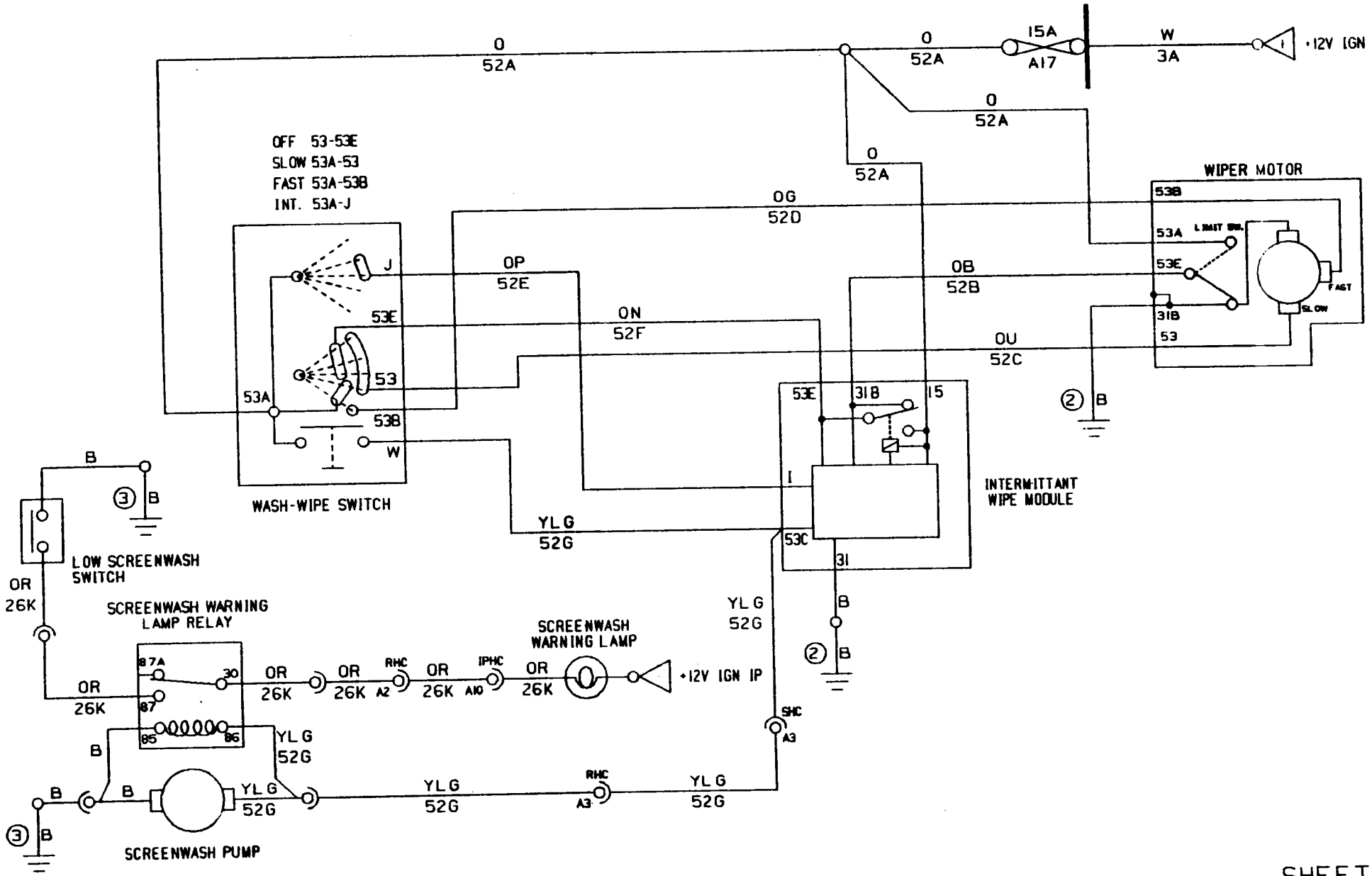


SHEET 6A

HORNS

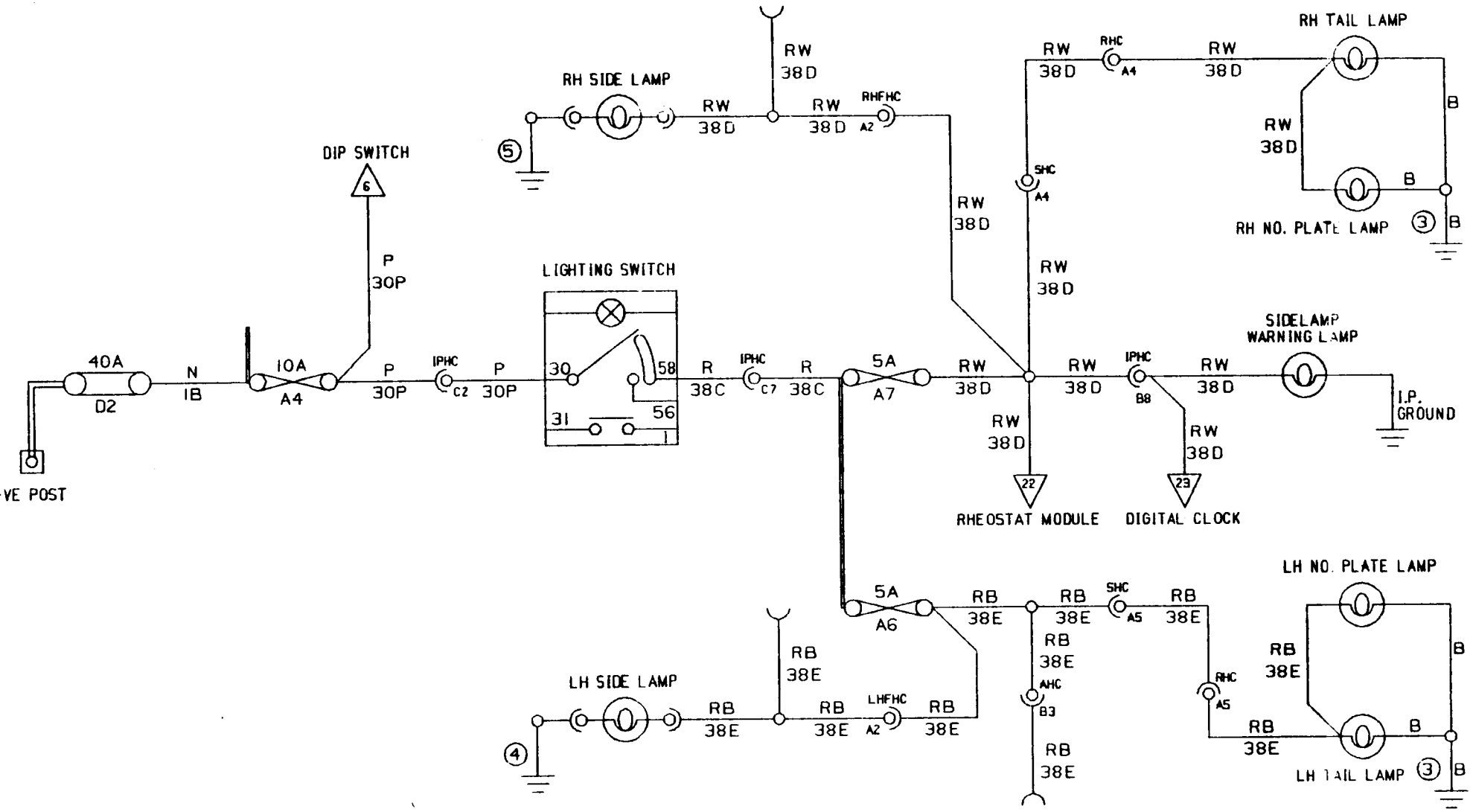

HORN HI NOTE
PY
54C
B
5
B
HORN RELAY
HORN LO NOTE
40A
D2
N
1B
15A
A1
PN
54B
3
5
2
1
PY
54C
RHFHC
A10
PY
54C
PY
54C
B
5
B
+VE POST
P
1J
27
+12V BATT
HORN SWITCH
PB
54D
COLUMN
GROUND
ALARM
29
PB
54D

WINDSCREEN WASH-WIPE

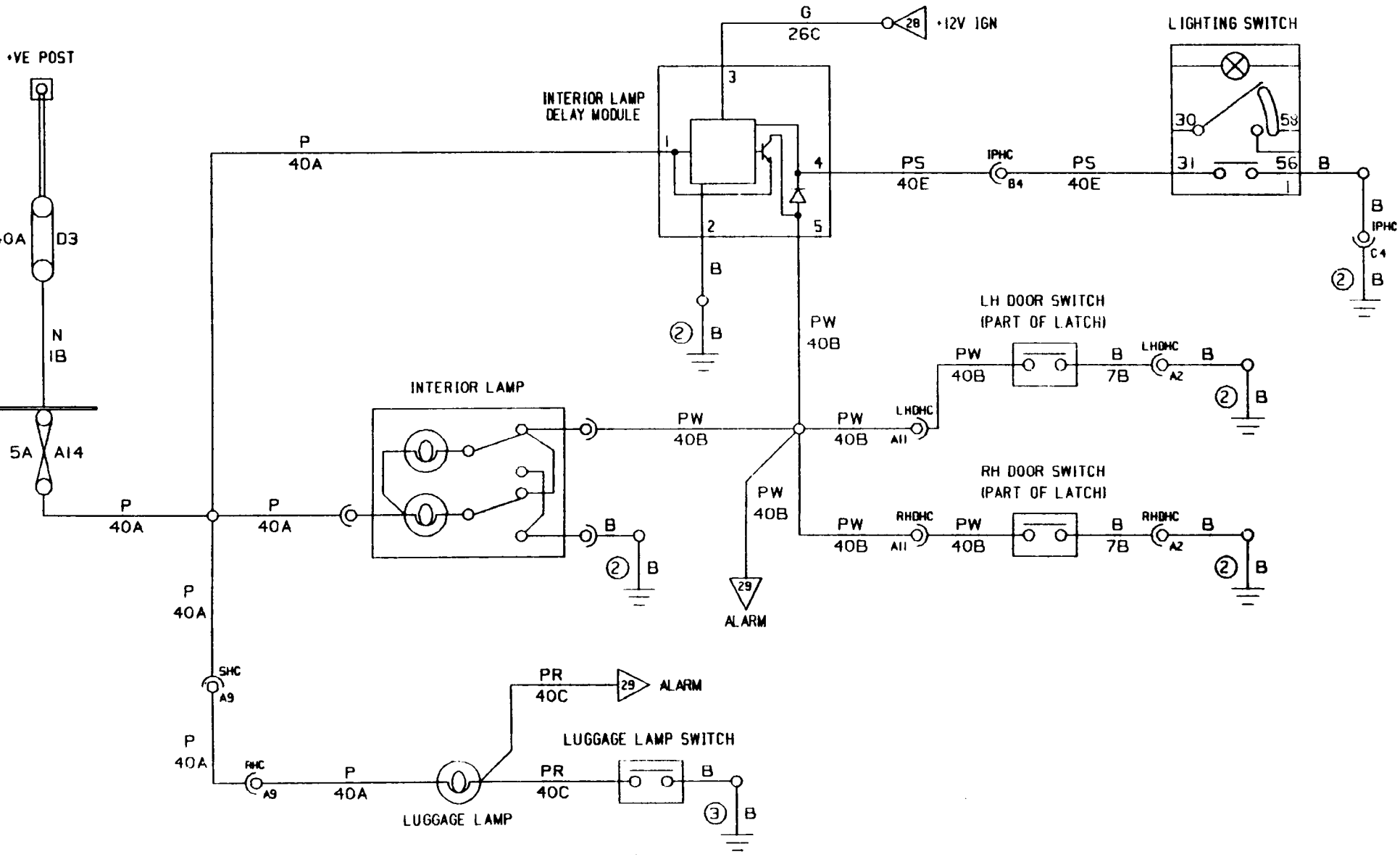


SHEET 8

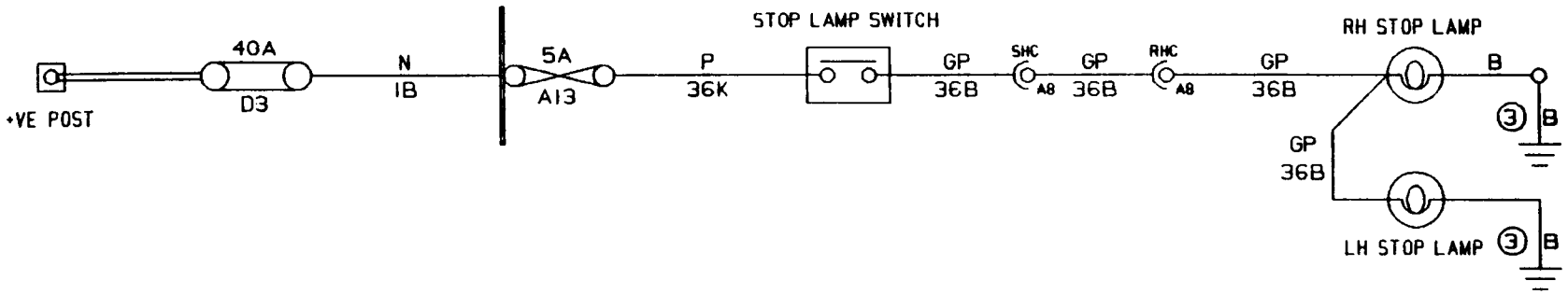
SIDE AND TAIL LAMPS



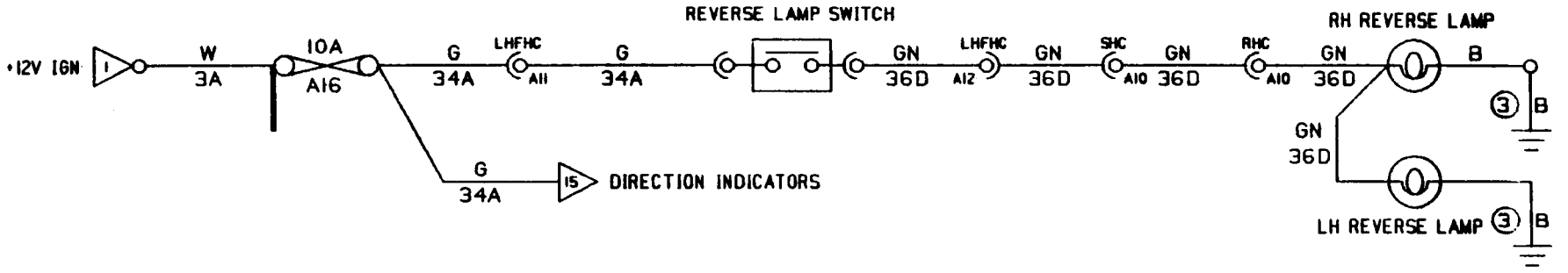
INTERIOR LAMPS



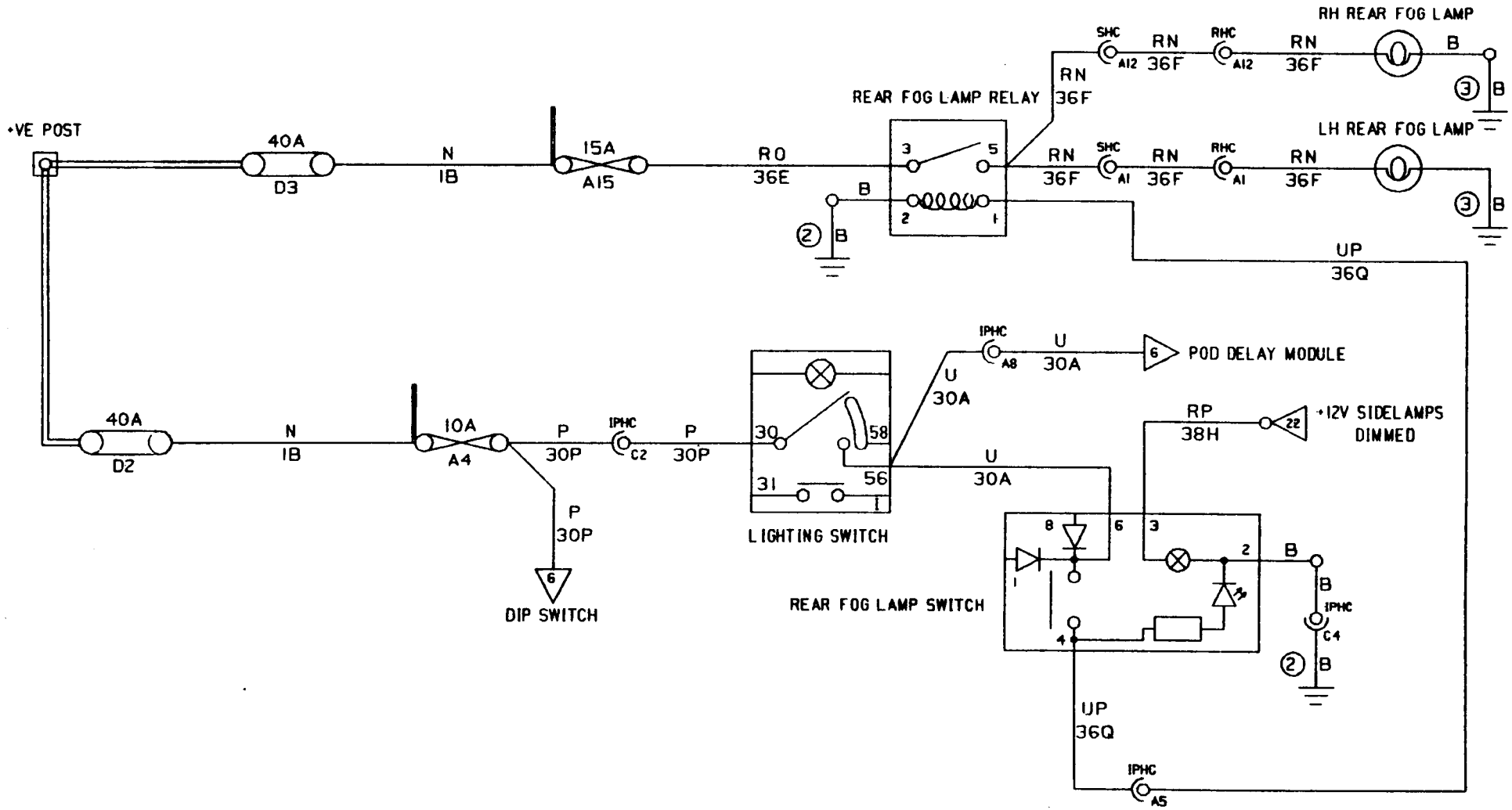
STOP LAMPS


+VE POST
40A
D3
N
1B
5A
A13
P
36K
STOP LAMP SWITCH
GP
36B
SHC
A8
GP
36B
RHC
A8
GP
36B
RH STOP LAMP
B
3
B
GP
36B
LH STOP LAMP
3
B

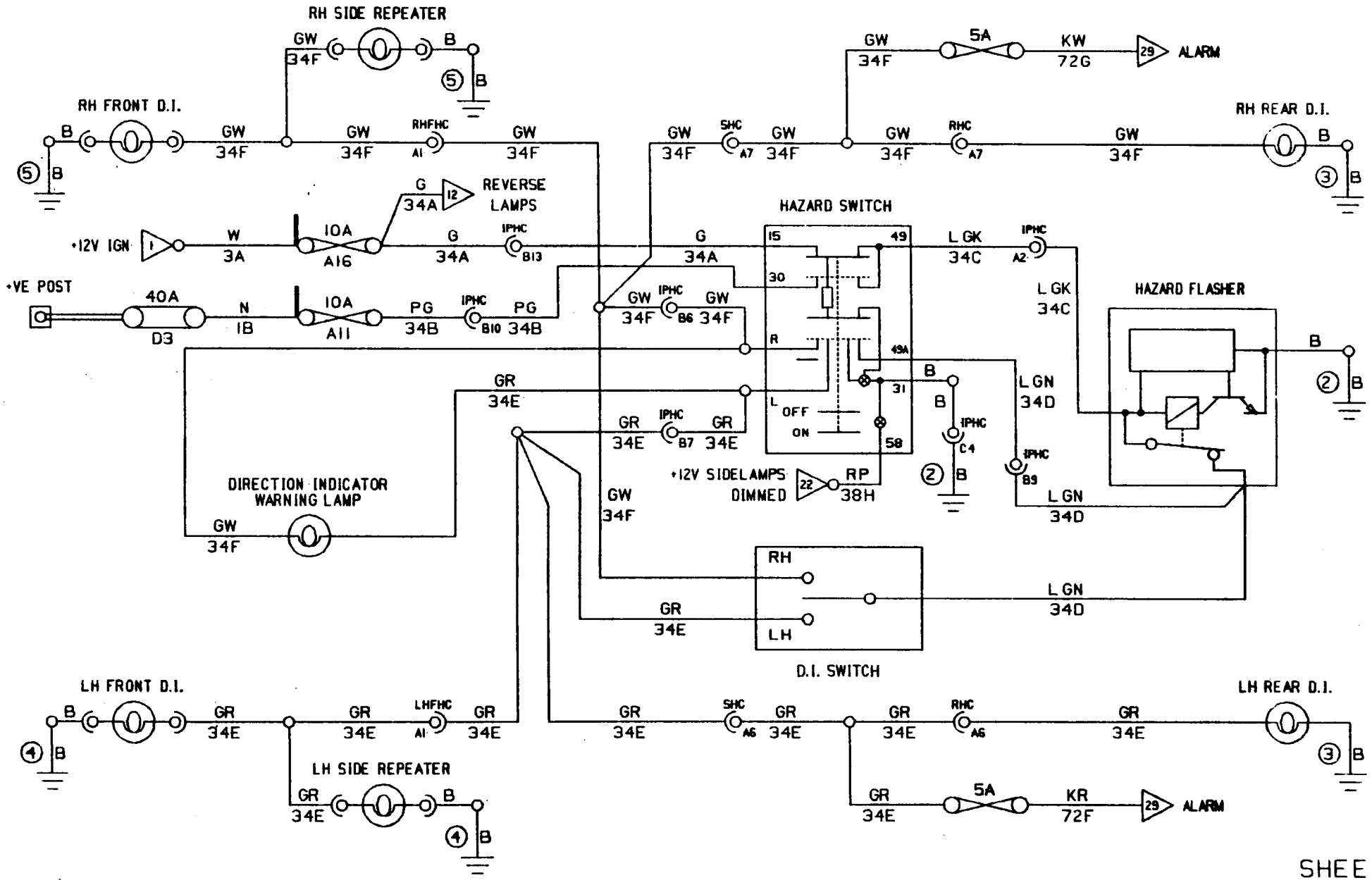
REVERSE LAMPS



REAR FOG LAMPS

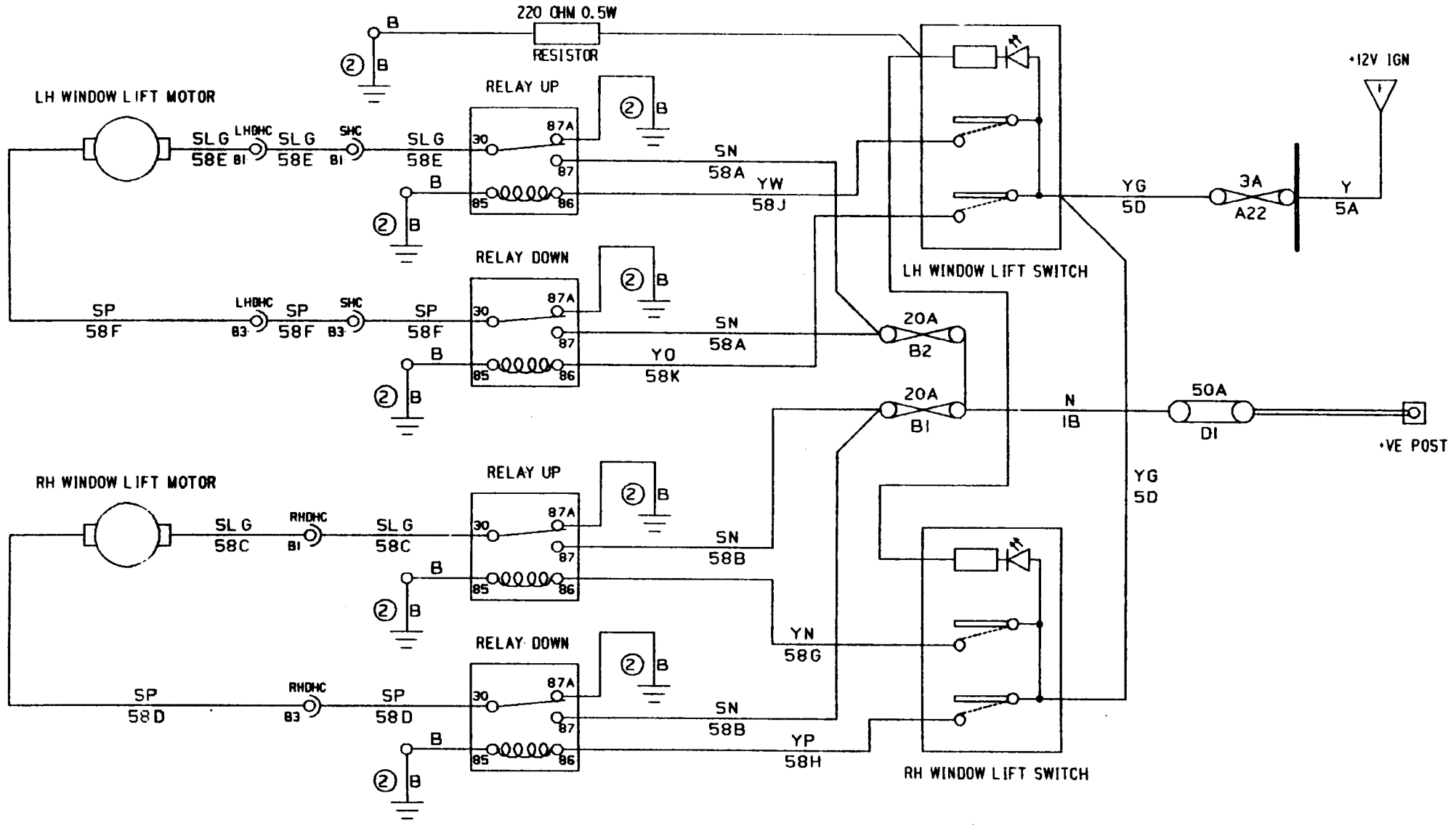


DIRECTION INDICATORS AND HAZARD

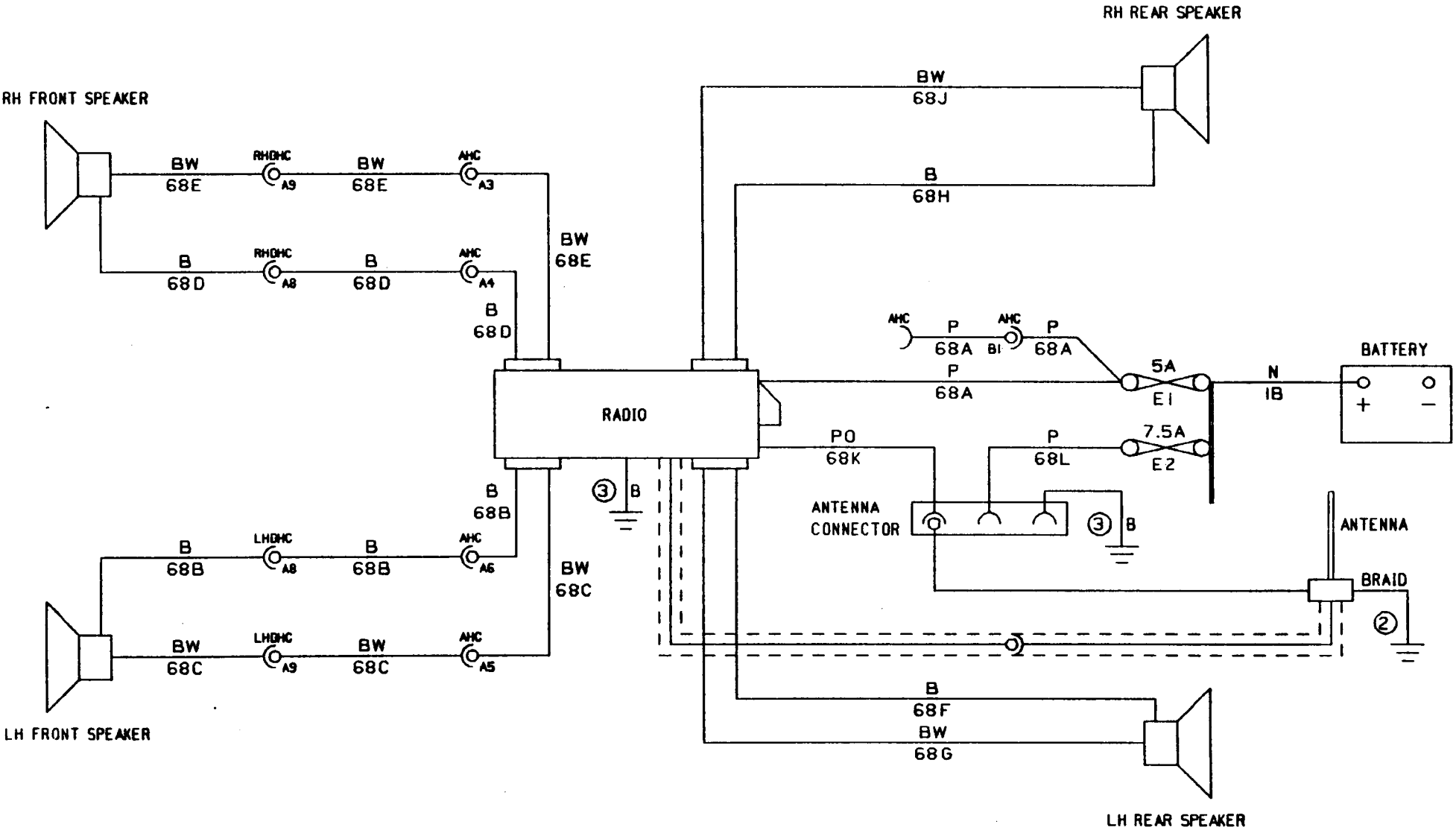


SHEET 15

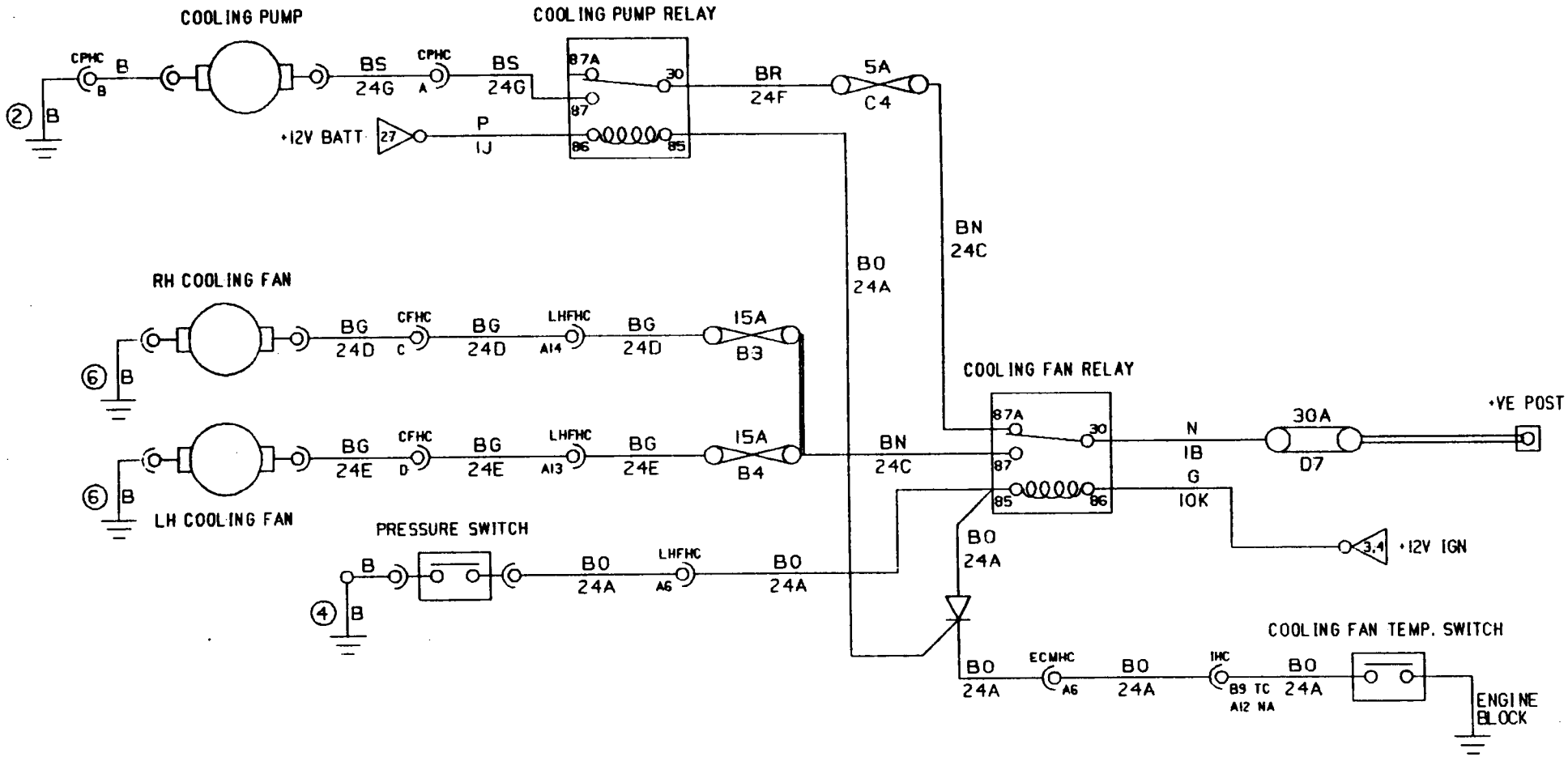
WINDOW LIFT


220 OHM 0.5W
RESISTOR
B
+12V IGN
LH WINDOW LIFT MOTOR
RELAY UP
RELAY DOWN
SLG 58E
LHDHC
SHC
SP 58F
SN 58A
YW 58J
YO 58K
LH WINDOW LIFT SWITCH
YG 5D
3A
A22
Y 5A
20A B2
20A B1
N 1B
50A D1
+VE POST
RH WINDOW LIFT MOTOR
SLG 58C
RHDHC
SP 58D
SN 58B
YN 58G
YP 58H
RH WINDOW LIFT SWITCH
87A
30
87
85
86

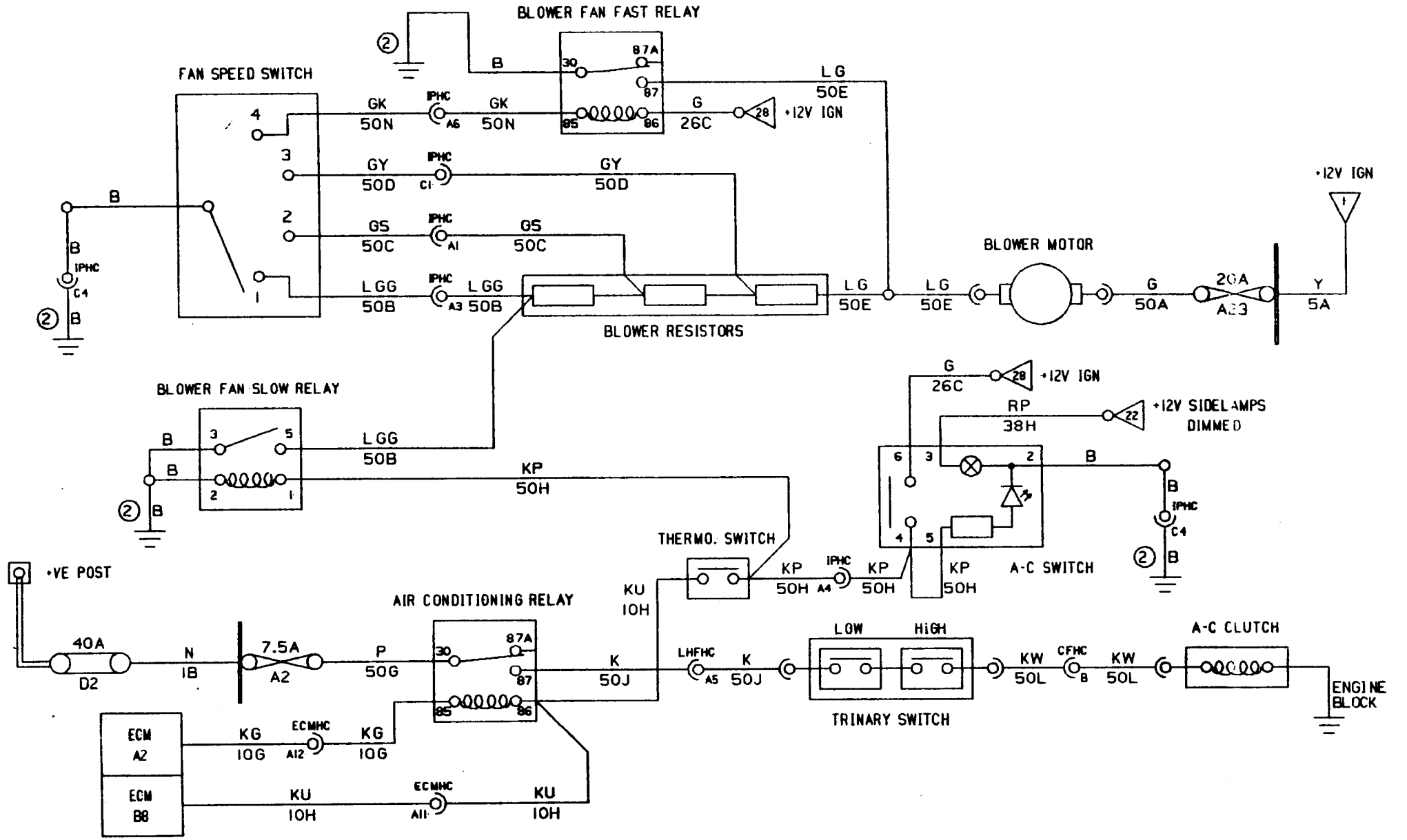
IN CAR ENTERTAINMENT



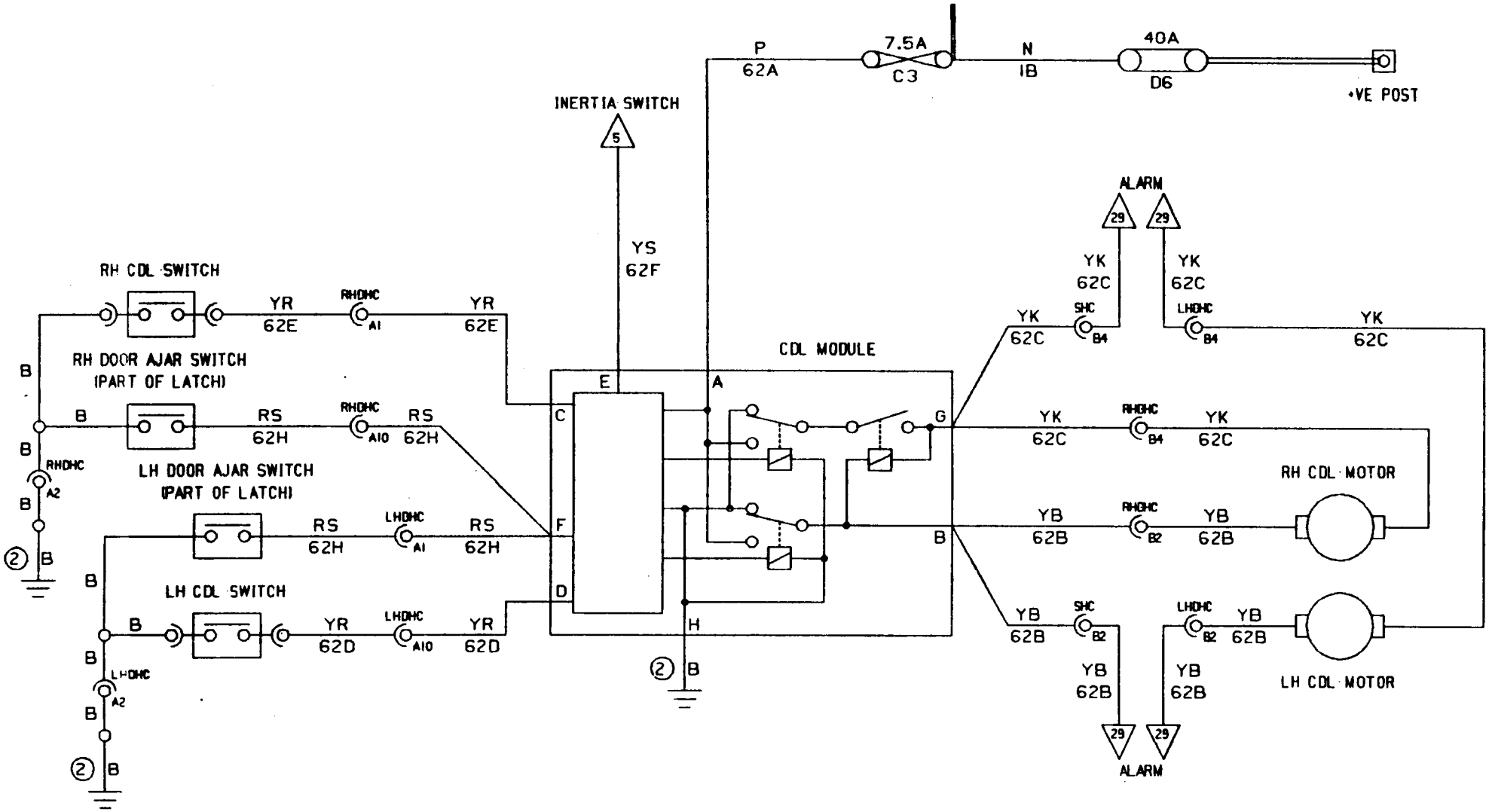
COOLING FANS



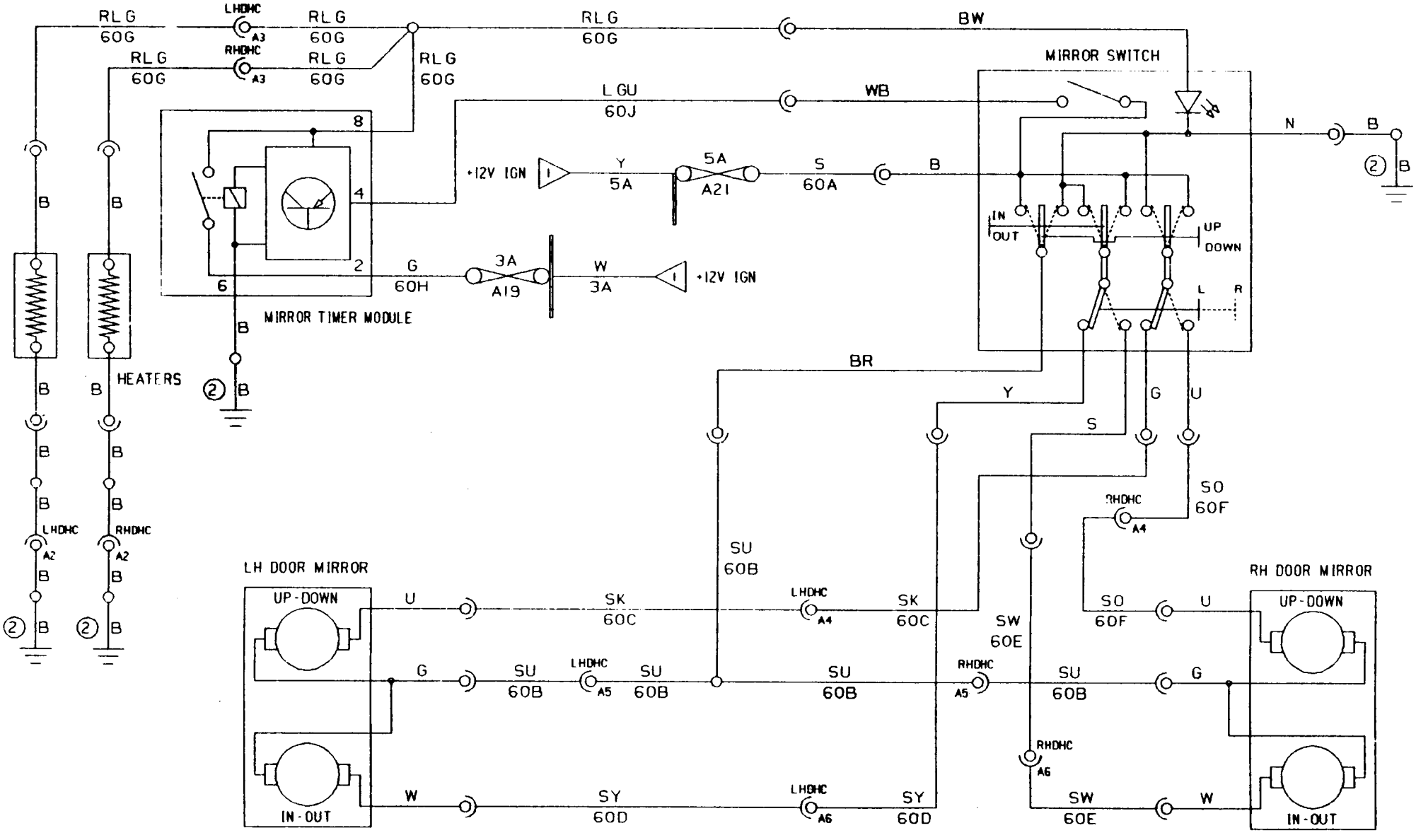
HEATER AND AIR CONDITIONING



CENTRAL DOOR LOCKING

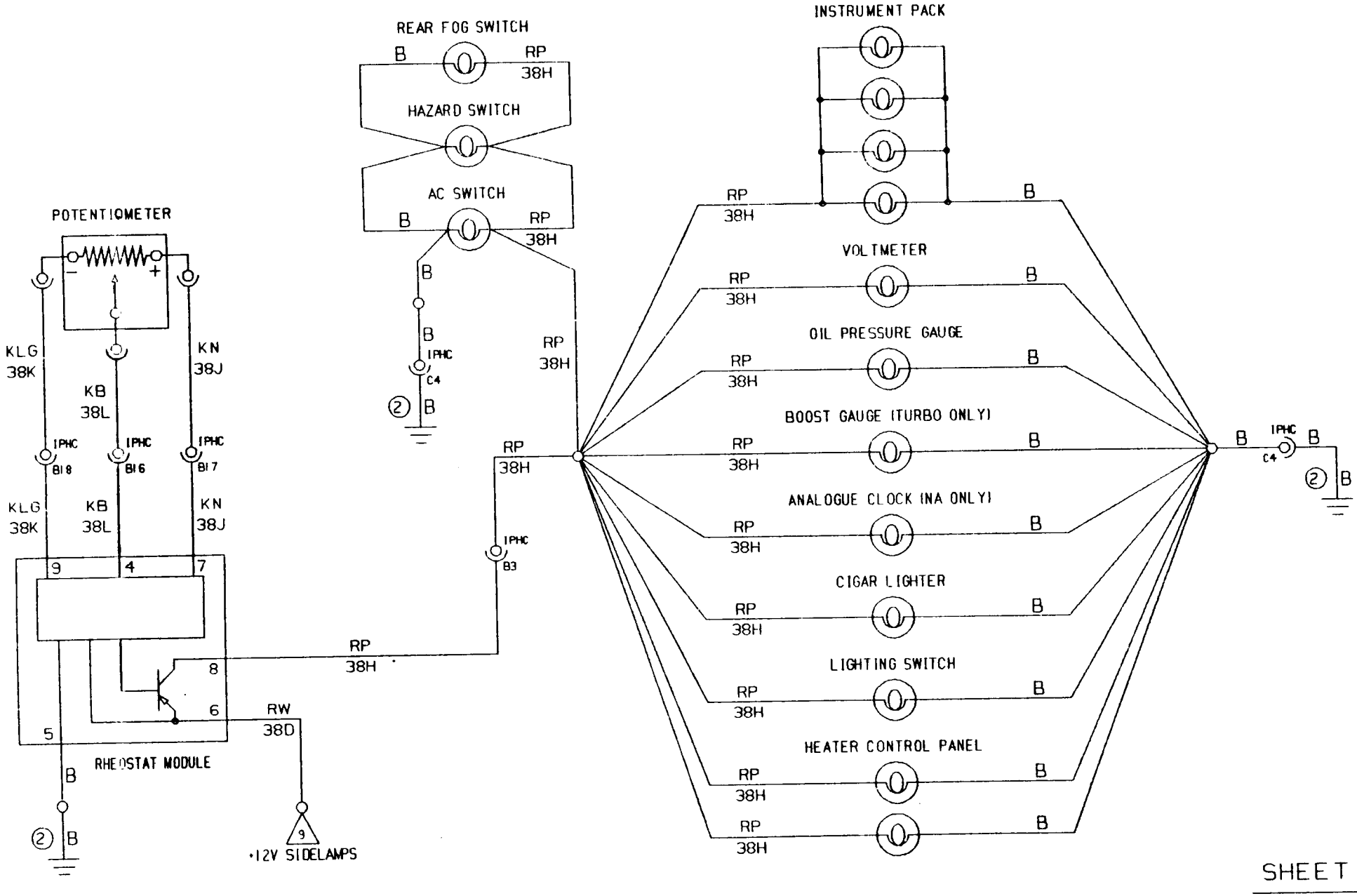


DOOR MIRRORS



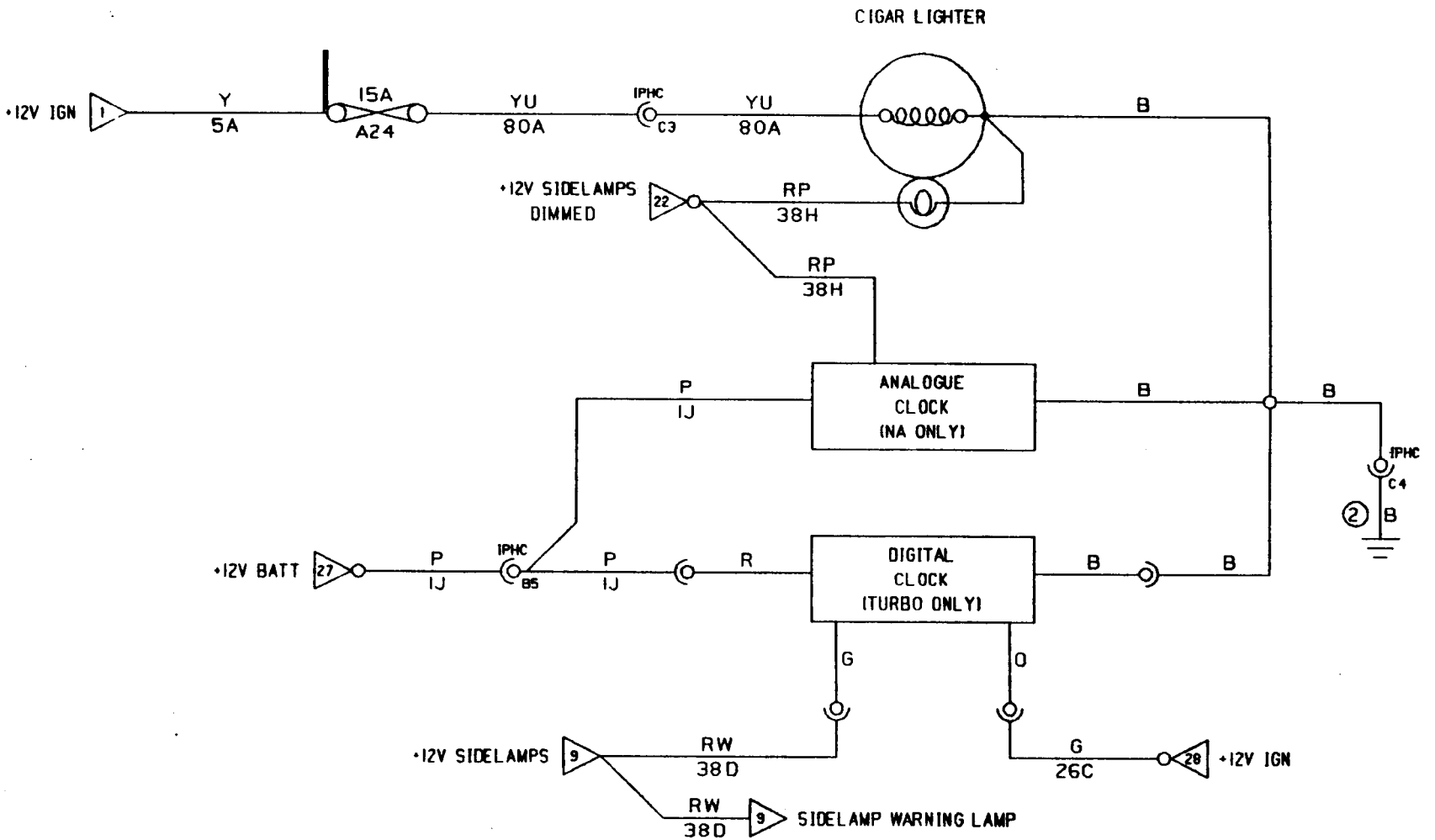
SHEET 21

RHEOSTAT & PANEL ILLUMINATION

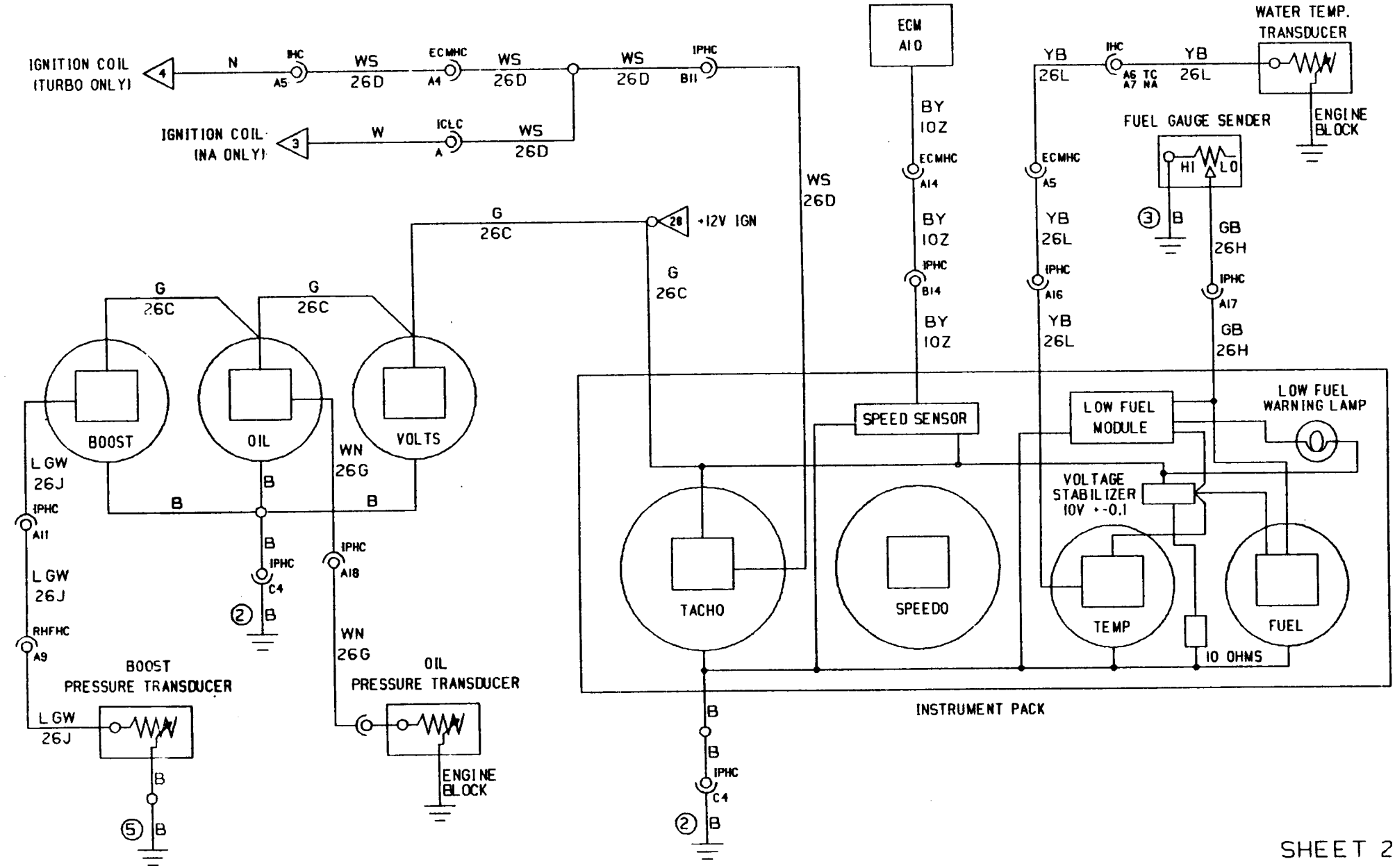


SHEET 22

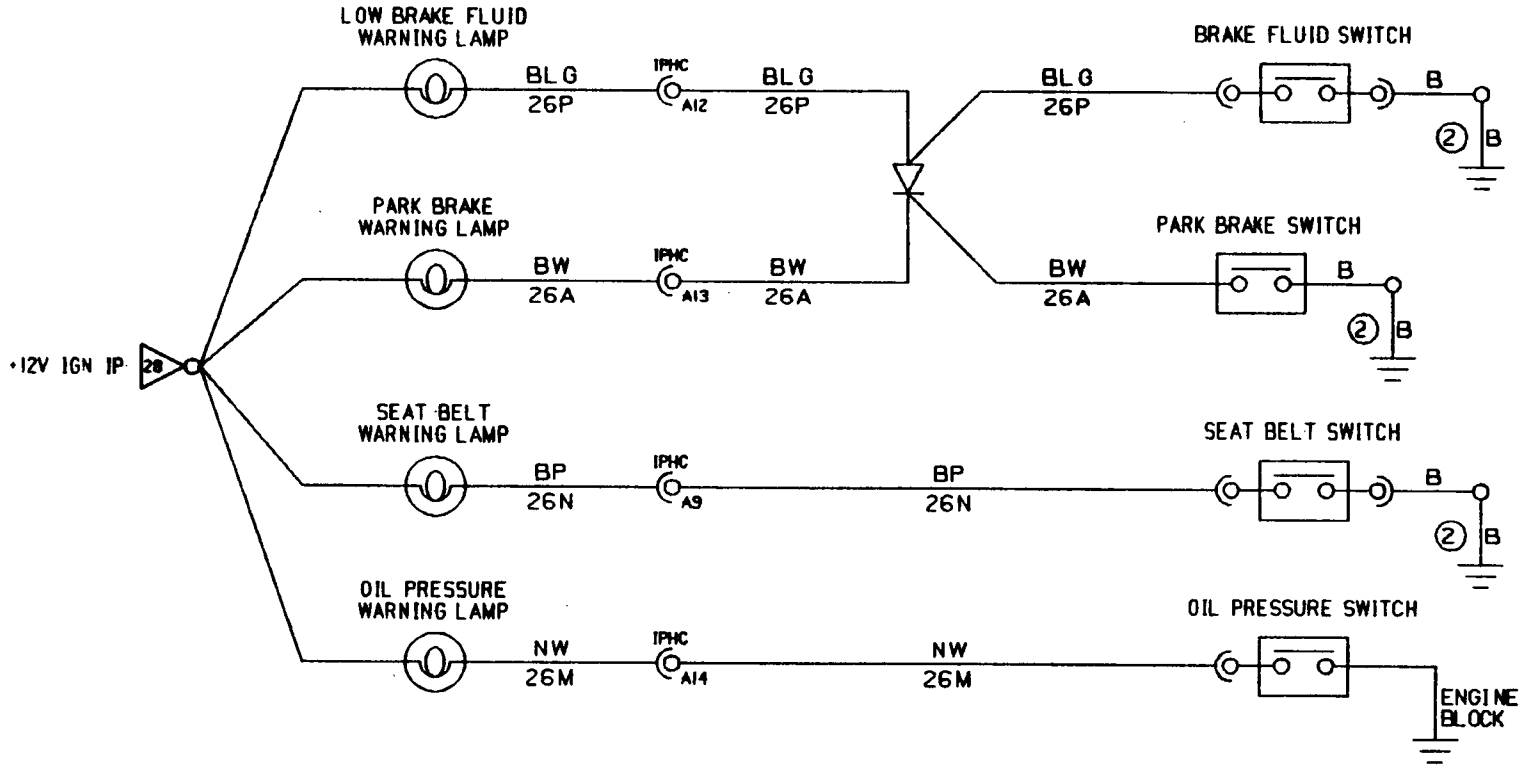
CLOCK & CIGAR LIGHTER



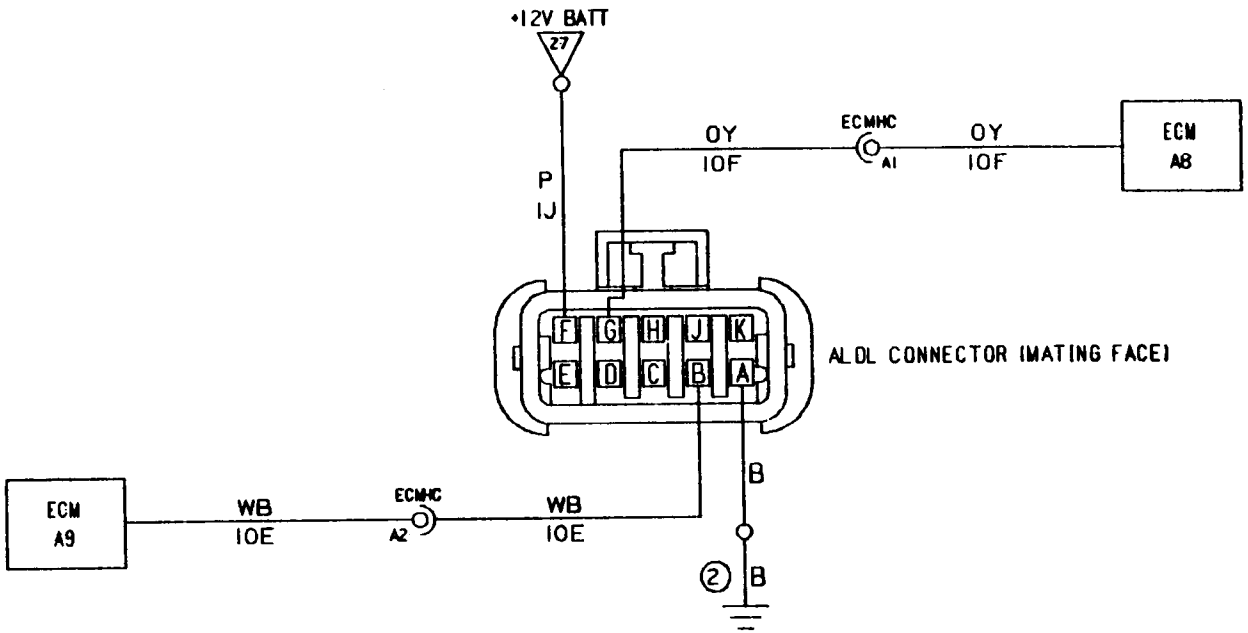
INSTRUMENTS



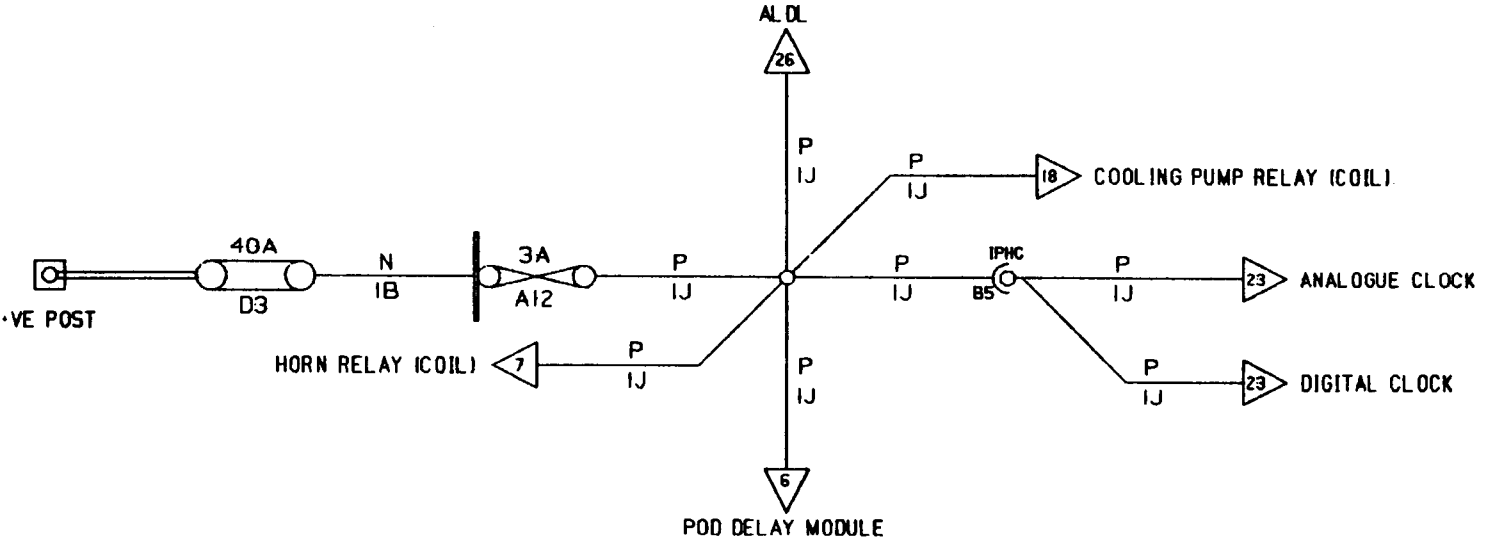
WARNING LAMPS



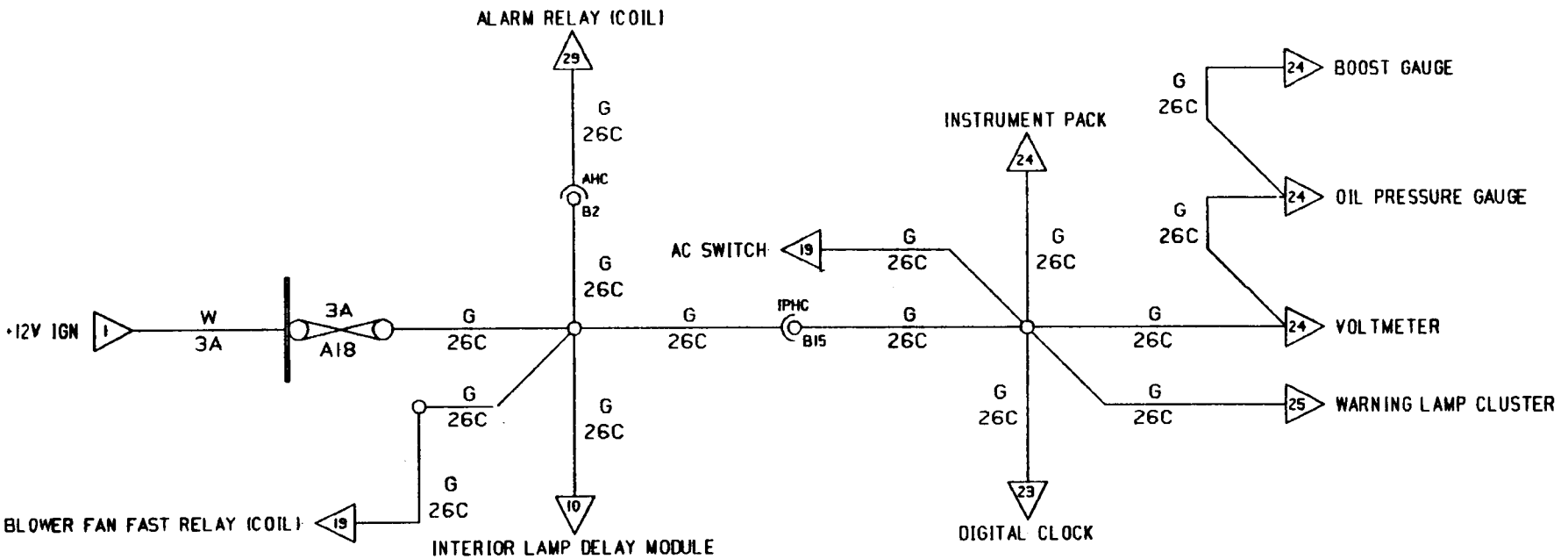
NO CHARGE WARNING LAMP SEE SHEET 2
CHECK ENGINE WARNING LAMP SEE SHEET 3, 4
MAIN BEAM WARNING LAMP SEE SHEET 6
SIDELAMP WARNING LAMP SEE SHEET 9
D.I. WARNING LAMP SEE SHEET 15
LOW FUEL WARNING LAMP SEE SHEET 24
LOW SCREENWASH WARNING LAMP SEE SHEET 8


+12V BATT
27
P
IJ
0Y
10F
ECMHC
A1
0Y
10F
ECM
A8
F
G
H
J
K
E
D
C
B
A
ALDL CONNECTOR (MATING FACE)
B
ECM
A9
WB
10E
ECMHC
A2
WB
10E
2
B

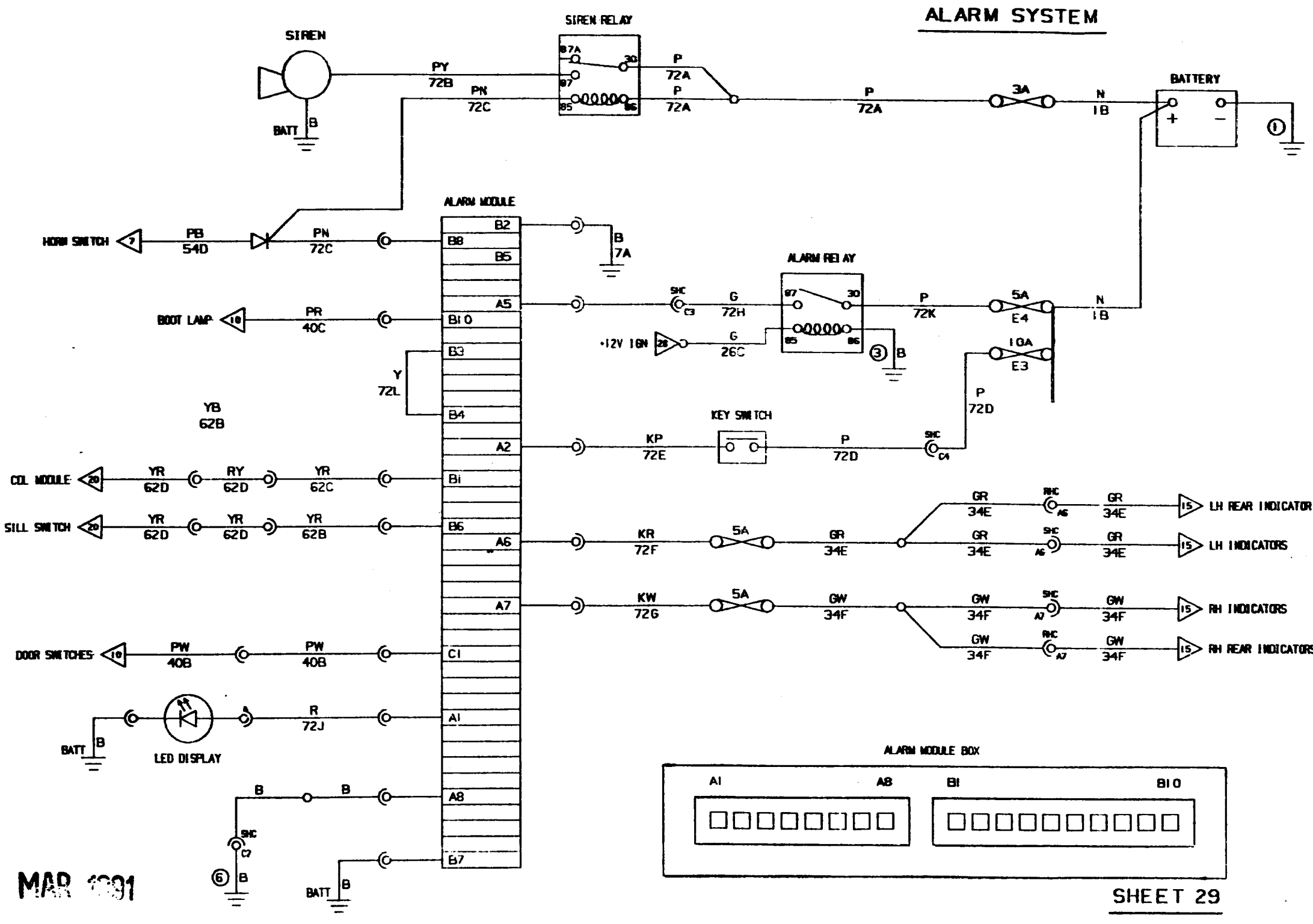
BATTERY SERVICES (FUSE A12)



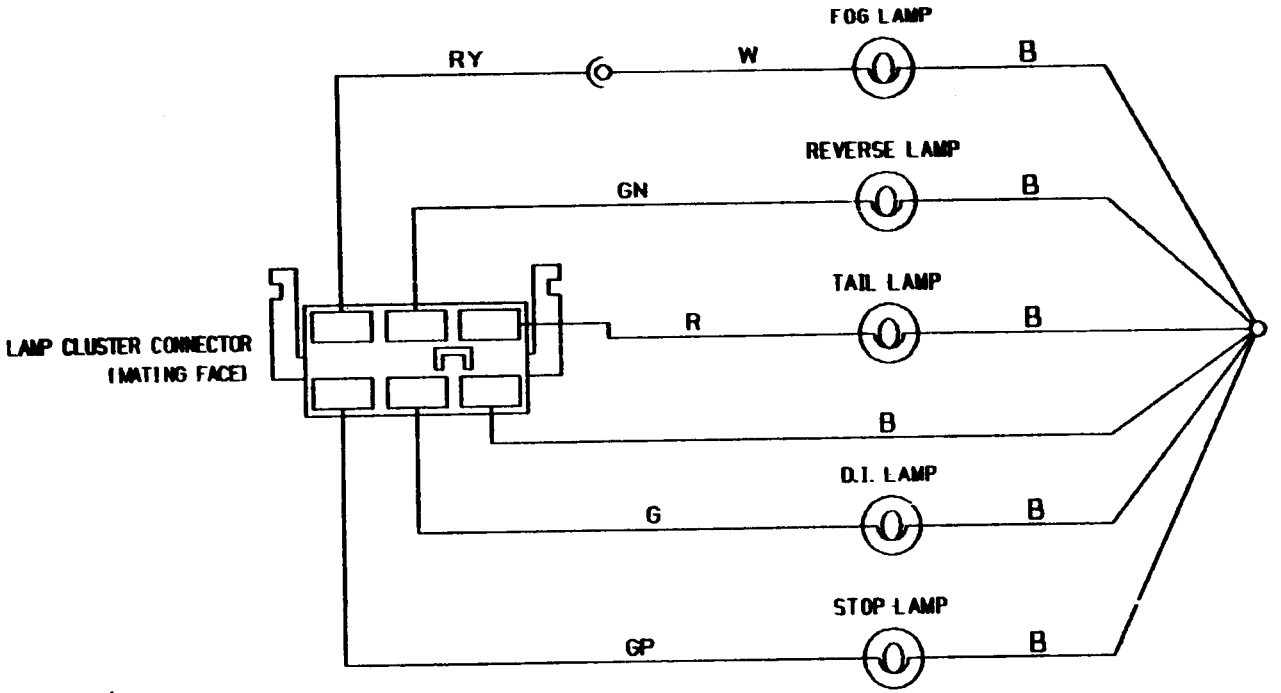
IGNITION SERVICES (FUSE A18)



ALARM SYSTEM



REAR LAMP CLUSTERS



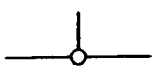
CONVENTION

CONNECTOR (WITH CAVITY NUMBER - SEE APPENDIX 4 & 5)

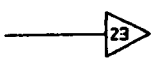
CONNECTOR CODES

AHC = ACCESSORIES HARNESS CONNECTOR
CFHC = COOLING FAN HARNESS CONNECTOR
CPHC = COOLING PUMP HARNESS CONNECTOR
ECMHC = ECM HARNESS CONNECTOR
ICLC = IGNITION COIL LEAD CONNECTOR
IHC = INJECTOR HARNESS CONNECTOR
IPHC = INSTRUMENT PACK HARNESS CONNECTOR
LHDHC = LH DOOR HARNESS CONNECTOR
LHFHC = LH FRONT HARNESS CONNECTOR
RHC = REAR HARNESS CONNECTOR
RHDHC = RH DOOR HARNESS CONNECTOR
RHFHC = RH FRONT HARNESS CONNECTOR
SHC = SECURITY HARNESS CONNECTOR (OPTIONAL)

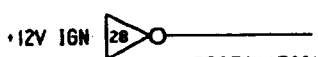
WHERE A CONNECTOR IS SHOWN WITH NO CODE
IT IS PART OF A COMPONENT ASSEMBLY ON A FLYING LEAD



SPLICE



CIGAR LIGHTER
DESTINATION BY SHEET NUMBER OF CABLE TO COMPONENT OR CIRCUIT



DESTINATION BY SHEET NUMBER OF CABLE FROM A SPLICE

WR
20A

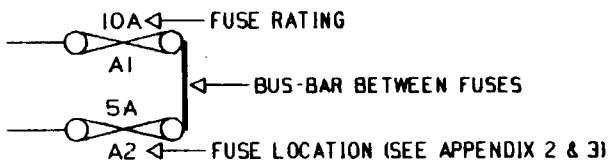
CABLE COLOUR
CIRCUIT CODE

COLOUR CODES

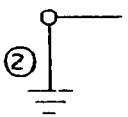
B = BLACK	P = PURPLE
G = GREEN	R = RED
K = PINK	S = SLATE
LG = LIGHT GREEN	U = BLUE
N = BROWN	W = WHITE
O = ORANGE	Y = YELLOW

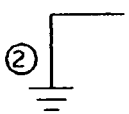
TWISTED PAIR

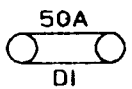
FUSES



GROUND POINTS (SEE APPENDIX 6 FOR LOCATIONS)







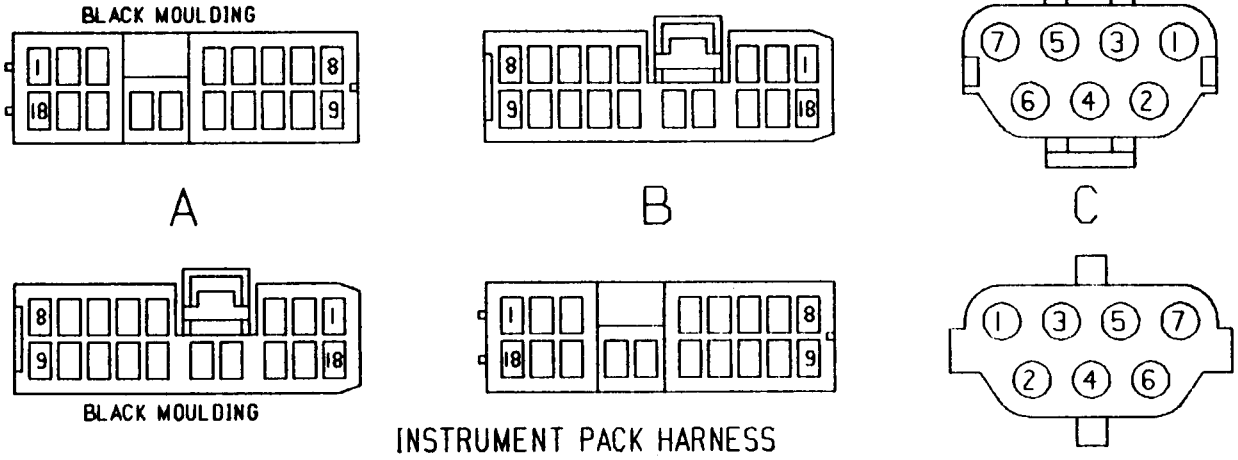
MAXIFUSE (SHORT CIRCUIT RATING ONLY)

APPENDIX 1

INTER-HARNESS CONNECTORS I (MATING FACE)

IPHC (MAIN HARNESS TO IP HARNESS)

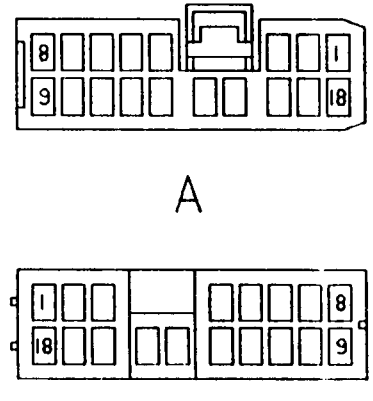
MAIN HARNESS



INSTRUMENT PACK HARNESS

ECMHC (ECM HARNESS TO MAIN HARNESS)

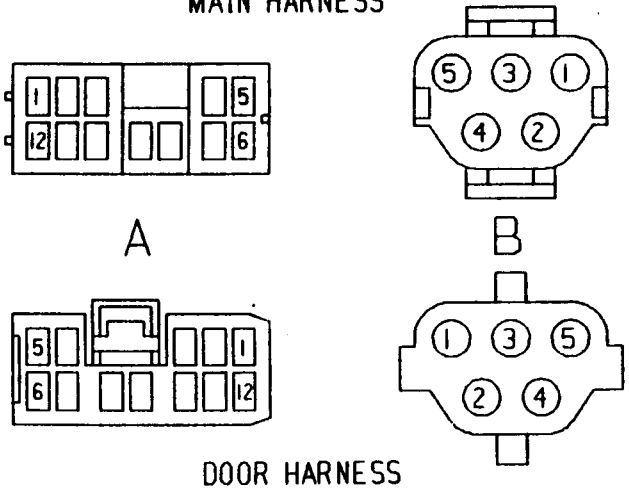
MAIN HARNESS



ECM HARNESS

LHDHC & RHDHC (MAIN HARNESS TO LH & RH DOOR HARNESS)

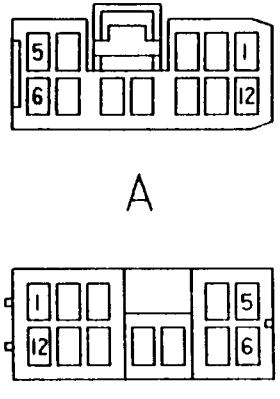
MAIN HARNESS



DOOR HARNESS

RHC (REAR HARNESS TO MAIN HARNESS)

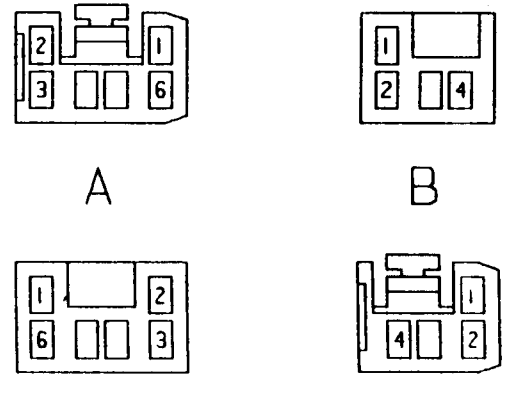
MAIN HARNESS



REAR HARNESS

AHC (ACCESSORIES HARNESS TO MAIN HARNESS)

MAIN HARNESS



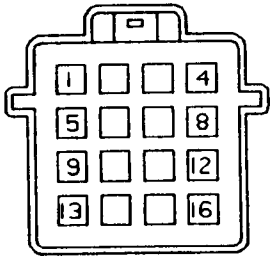
ACCESSORIES HARNESS

APPENDIX 2

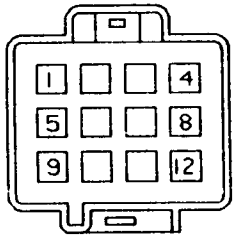
INTER-HARNESS CONNECTORS 2 (MATING FACE)

IHC (ECM HARNESS TO INJECTOR HARNESS)

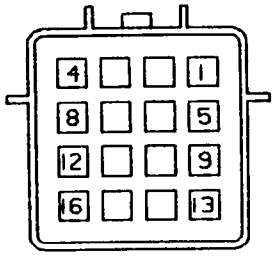
ECM HARNESS

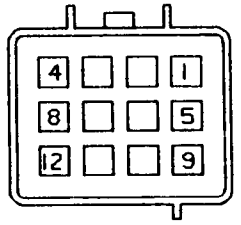


A



B

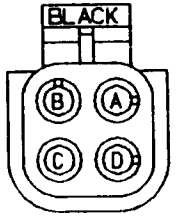




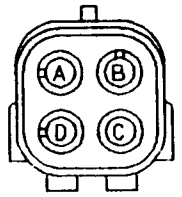
INJECTOR HARNESS

CFHC (LH FRONT HARNESS TO COOLING FAN HARNESS)

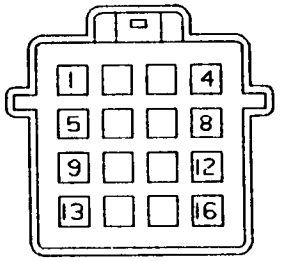
LH FRONT HARNESS



COOLING FAN HARNESS

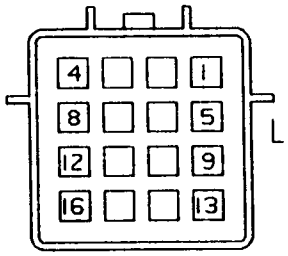


LHFHC (MAIN HARNESS TO LH FRONT HARNESS)



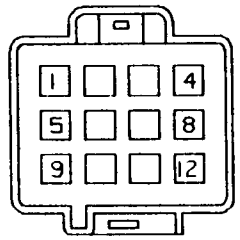
MAIN HARNESS

A



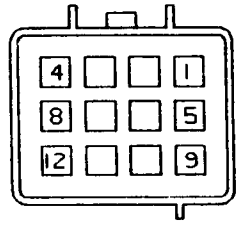
LH FRONT HARNESS

RHFHC (MAIN HARNESS TO RH FRONT HARNESS)



MAIN HARNESS

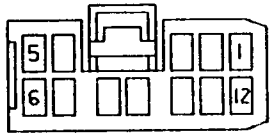
A



RH FRONT HARNESS

SHC (SECURITY HARNESS TO MAIN/ACCESSORIES HARNESS)

MAIN HARNESS



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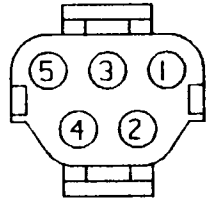

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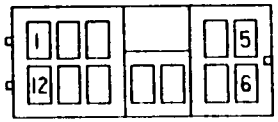
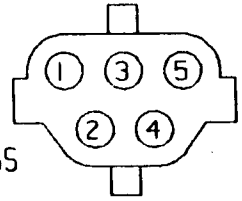
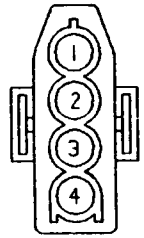


SECURITY HARNESS



ACCESSORIES HARNESS



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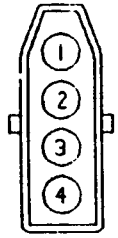

SECURITY HARNESS